

WANT TO LEAD?

Do you have what it takes to inspire and influence others? CIOs reveal what they look for in potential leaders. Page 54

E-COMMERCE PITFALLS

Web shopping may be easy, but technology problems and poor processes could keep the customers away. Page 48

XML GETS BUSY

XML starts to deliver on its starry-eyed promises, but with every silver lining there's a cloud or two. Page 76

COMPUTERWORLD

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SHARON CARBONE, project management consultant at New England Business Service Inc., spends several days per month reviewing projects to ensure compliance with the new accounting rule

WEBB CHAPPELL

MORE MANAGERS MONITOR E-MAIL

Computerworld survey: *Fearing lawsuits, loss of secrets, employers scan more worker messages*

BY DOMINIQUE DECKMYN

Spot checks just aren't good enough anymore. The tide is turning toward systematic monitoring of corporate e-mail traffic using content-monitoring software that scans for troublesome words, according to an exclusive *Computerworld* survey.

About 31% of 75 corporate e-mail managers already use monitoring software either regularly or for spot checks. Of those who don't, 21% plan to install it next year, according to the survey.

The reason: Users of monitoring software said they're concerned about protecting their intellectual property and guarding themselves against litigation.

Put It in Writing

Four points that should be in an e-mail policy:

- A statement that computer systems are the company's property and are to be used for business purposes only.
- A clear definition of what is and isn't appropriate use of e-mail.
- A statement to employees that they can't expect e-mail to be private and that all e-mail may be monitored.
- An explanation that violations can lead to disciplinary action, up to and including termination.

SOURCE: MICHAEL OVERLY, E-COMMERCE AND IT ATTORNEY AT FOLEY & LARDNER, LOS ANGELES

"I didn't really realize how much of a problem I had until I started using [monitoring software]," said Jeff LePage, director of MIS at American Fast Freight Inc. in Kent, Wash.

LePage is using MIME-sweeper software from Kirk-E-Mail Monitors, page 97

MERGER SPURS IT COST, JOB CUTS

ConEd/Northeast see pressure to cut rates

BY JULIA KING

Consolidated Edison's \$3.3 billion merger with Northeast Utilities is bound to trigger sharp cost-cutting plus employee layoffs within the two companies' IT groups, analysts said last week.

"The merger means an immediate redundancy in the IT infrastructure, plus deregulation means tremendous pressure," *Merger*, page 97

HOLDING IT ACCOUNTABLE

A NEW ACCOUNTING STANDARD for software development will force dramatic changes in the way IT projects are run, reports Kathleen Melymuka. The bookkeeping rules require much greater discipline in project management and, like Y2K, they can't be ignored — not with the SEC watching. IT departments will need to keep detailed records of the time spent on tasks so that internal software costs are correctly fed into the general ledger. Application development units that can't handle these chores may be replaced by an outsourcer that can.

Report begins on page 46.

APPLICATION DEVELOPMENT

REPORT: CODE QUALITY TO TAKE A HIT

But many CIOs defend integrity of software

BY THOMAS HOFFMAN

As if the year 2000 problem won't be enough of a Pandora's box, here's another one for IT organizations: Software developed by user companies next year could be buggier than ever.

According to soon-to-be-released research from Stamford, Conn.-based Meta Group Inc., more than half the world's biggest companies have disbanded their in-house software quality assurance

departments as they have pulled specialists onto their Y2K projects. The trickle-down effect, according to Meta Group, is that few of these companies will redeploy their quality teams, so application development error rates will increase.



MERRILL LYNCH'S JOHN MCKINLEY disagrees with Meta Group findings

Meta Group's software quality assurance research, which is drawn from its "Worldwide IT Trends and Benchmark Report," is based on survey responses from information technology executives at 318 of the world's 2,000 *Code Quality*, page 97

CAN ACQUISITION STAY HEALTHY?

Aetna/Prudential face data challenges

BY THOMAS HOFFMAN

Aetna Inc.'s top IT executive said his company is set to absorb its third major health insurance acquisition in three years with the takeover of Prudential HealthCare.

But Wall Street analysts and health care consultants warned that despite its merger and acquisition experience, the *Aetna*, page 16

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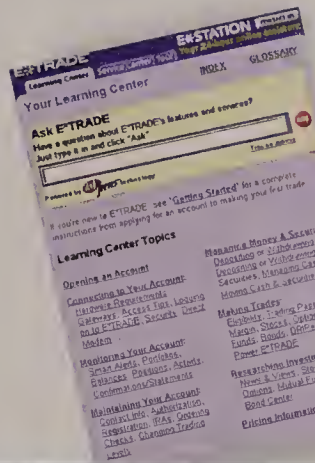


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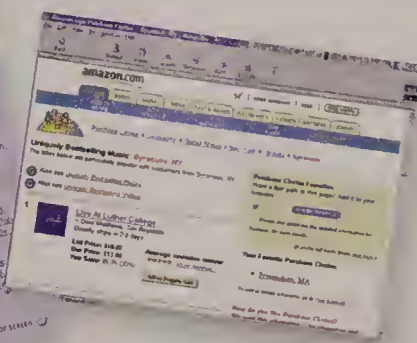
MCI CHIEF SPEAKS

MCI WorldCom Vice Chairman John Sidgmore assures *Computerworld* readers that WorldCom's planned purchase of Sprint won't mean higher prices or worse service. Page 66



RUDE BEHAVIOR

Impolite sites drive away customers. Reviews show how *not* to deal with the public. Page 40



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WE CANNOT
GIVE A
PRECISE
FIGURE.

AN IMMIGRATION AND NATURALIZATION SERVICE SPOKESWOMAN, ON THE AGENCY'S UNCERTAINTY ABOUT HOW MANY H-1B VISAS IT MAY HAVE MISTAKENLY GRANTED FOR FISCAL 1999. SEE PAGE 4.

AT DEADLINE**Win 2000 Package:
\$1,080-Plus Per Seat**

Migration to Windows 2000 Professional will cost at least \$973 per desktop, and adopting Windows 2000 Server will pile on \$107 more per client, according to a Giga Information Group Inc. report. Despite those costs, companies will see a return on their investment in as soon as a year, Giga said.

More Melissa Viruses

Two new destructive variants of the Melissa virus have cropped up that seek to destroy files and e-mail themselves to others. W97M/Melissa.u tries to remove important system commands from a victim's system, while W97M/Melissa.v looks to delete files and directories in neighboring systems on a network, according to antivirus vendor Network Associates Inc. The good news: These variants appear to be spreading much more slowly than the initial Melissa outbreak in late March.

Online Car Loans Up

Online financing of new car and truck purchases will account for 65% to 70% of that market within the next five years, predicts a study to be released today by CNW Marketing/Research Corp. in Bandon, Ore. Currently, only 11% of vehicle financing is handled online, while car dealers and banks finance roughly 35% and 55% of vehicles, respectively.

Exchange for Rent

Microsoft Corp. has quietly started to pilot a subscription-based licensing model for Exchange that would make it easier for application service providers to offer Exchange as a rented service. Until now, Microsoft hasn't offered subscription-based licensing for any products.

Sun Profits Rise 32%

Sun Microsystems Inc. said earnings for the quarter ended Sept. 26 jumped 32% over the same quarter last year to \$274.8 million on record revenue of \$3.1 billion. The company said it gained share in key markets such as Internet servers.

Portals Under Fire

Users skeptical about 'superportal' value

BY CAROL SLIWA
LAS VEGAS

ATTENDEES AT i2 Technologies Inc.'s customer conference cast a critical eye at the Internet portal craze last week when their host unveiled its ambitiously conceived TradeMatrix.com.

Billed as a "business superportal," TradeMatrix.com won't merely provide a digital storefront where buyers and sellers can meet. Rather, the Dallas-based software vendor's marketplace purports to be a collective site that can link other portals, including those being established by the company's large customers such as Alliant Food Service Inc. and Caterpillar Inc.

The collaboration-oriented portal promises real-time integration with partners' back-

end fulfillment processes. In turn, business shoppers will be able to check inventory, consolidate orders across many vendors and integrate logistics for multiple-item orders.

TradeMatrix.com is expected to launch early next year but may take years to achieve its full vision. Many customers said they're not even close to creating or participating in a business portal. And several questioned the business benefits of leaping onto the portal bandwagon.

"If you're the buyer, this is good. If I'm the seller, I'm not so sure this is great. Why do I want all my competitors' information on the same screen? I'm not sure why I'd want to sign up," said Robert Squires, director of enterprise planning at Bristol-Myers Squibb Co. in New York.

The impersonal nature of a

Business Portal

Features of TradeMatrix.com:

- Multiple options for consolidating orders across many vendors
- Integration of logistics in multiple-item orders
- Real-time integration with back-end fulfillment processes
- Ability to tap into multiple portals and Web sites

Note: The portal is due early next year from i2 Technologies Inc.

portal also worries companies that emphasize customer service. "We know who our customers are, and we want to be able to shake their hands, take them out to dinner and collaborate with them. A trade portal is an anonymous way to do it," said Simon Eagle, a marketing manager at U.K.-based Cox Pharmaceuticals.

If key customers demand that

a supplier join a specific portal, the company may have no choice. The inevitability of electronic business is not lost on Alliant CIO Barbara Moss. By joining i2's portal before its launch, Moss said she hopes Alliant will gain an "early-mover advantage," building up business partnerships and solidifying customer relationships.

"I look at the Matrix as kind of a Grand Central Station that's going to bring together a number of businesses, customers and suppliers," Moss said. Deerfield, Ill.-based Alliant, which uses i2's supply-chain planning software, later this year plans to launch its own electronic marketplace that will link to TradeMatrix.com.

But the integration work will take time, as will gathering partners. So far, i2 has commitments only from Alliant and Caterpillar, though it claims to have verbal agreements with Hewlett-Packard Co., IBM and Sun Microsystems Inc. ▀

MOREONLINE

For Computerworld coverage of portals and related links, visit our Web site. www.computerworld.com/more

Feds Backpedal on H-1B Visa Miscount

Immigration agency to hire an auditor

BY KIM S. NASH

As IT groups gear up to petition for this year's allotment of visas for much-needed technical workers, the Immigration and Naturalization Service (INS) backpedaled last week on its recent acknowledgment that it had granted 10,000 to 20,000 too many H-1B visas for fiscal 1999.

The INS now says it doesn't know how many it issued at all.

"We've been looking at this more and more. We cannot give a precise figure," said Elaine Komis, a spokeswoman for the INS.

While the agency works to figure out what went wrong, user companies press on with visa applications. "IT demand

[for the visas] is still as strong as last year," said Ron Schaefer, senior consultant at Organization Resources Counselors Inc. in New York.

The INS's uncertainty about the mistake angered some in Congress. "It's clear they don't know what they're doing. [The] INS does not have a grasp of their own accounting procedures," said Stuart Anderson, an official involved with the visa issue at the office

of Sen. Spencer Abraham (R-Mich.). Abraham chairs a congressional subcommittee that oversees immigration and is a tough critic of the agency.

Previously, the INS confirmed to *Computerworld* that software and possibly human error resulted in it granting up to 20,000 extra visas [News, Oct. 11].

Telephone and face-to-face talks between the agency and congressmen continued last week, with no decision on

what step to take next. If 10,000 to 20,000 too many people have visas in error, they could be told to stop work and return to their home countries, or the overage could be deducted from the 115,000-visa allotment of fiscal year 2000, which started Oct. 1.

However, there's debate about whether the INS has the authority to do that or whether Congress instead must pass a law to that effect.

And it will be hard to decide what to do until an outside auditor investigates the accounting problem, Komis said. ▀

Microsoft Clause Irks Users

BY KIM S. NASH

Microsoft Corp. President Steve Ballmer last week said he plans to "take a look at" a licensing clause that prohibits users from publicly discussing the performance of Microsoft software.

The clause, which some information technology shops have complained about, "sounds like a goofy issue to

me," Ballmer said, responding to a question from a Gartner Group Inc. analyst at the consulting firm's annual conference in Lake Buena Vista, Fla., (see related story, page 20).

Other software makers, such as Oracle Corp., include similar gag orders in their licenses. But Microsoft may want to omit the clause to promote public goodwill as it awaits a


decision in its federal antitrust case, said Lawrence Goffney, an attorney who specializes in computer law at Akin, Gump, Strauss, Hauer & Feld LLP in Washington.

"When you become dominant like Microsoft, [such a clause] tends to seem to be their leveraging power against their users," Goffney said.

Ballmer "didn't make a commitment to change anything," a Microsoft spokeswoman said. "He wrote himself a note to look into it." ▀

MOREONLINE

For articles, FAQs and other resources related to H-1B visas, visit our Web site. www.computerworld.com/more



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Microsoft Users Calm Amid Security Alert

Survey: Defenses in Redmond's products are adequate — for modest roles, anyway

BY DAVID ORENSTEIN

NEW SECURITY problems in core Microsoft Corp. products were discovered last week, but enterprise users say security in Microsoft products is adequate, at least for the modest roles the products often play.

Last week's bug and virus collection included the following: an Internet Explorer hole that allows scripts running in frames to make files on a client machine readable to the Web server (see story below); a Windows NT virus called WinNT.Infis that mimics a device driver and disables applications; two new strains of the Windows-only Melissa virus; and a hole in Microsoft's Java virtual machine.

Despite the constant drumbeat of such reports, only one in 12 users in a *Computerworld* survey of 75 information technology managers said they have had a costly security problem with Microsoft products. On the other hand, one in five said they have refused to use a Microsoft product because of security concerns.

Two-thirds of the users said they are satisfied with how fast Microsoft issues security

alerts and fixes, and 93% said their network managers install the fixes effectively.

At Carlton Cards, the retail division of American Greetings Corp., Information Systems Vice President George Purdy said he's not only satisfied with the security of Microsoft's products but would trust them to run a potential extranet in which the company shares data and collaborates with suppliers.

"Up to this point, we have had no security problems," he said. The company's departmental servers run NT, and its desktops run Windows 98. But the company's more critical data resides on IBM AS/400s.

Many users are satisfied with Microsoft's security because they are likely giving it modest roles, said analyst Carl Howe at Forrester Research Inc. in Cambridge, Mass. For the highest-end roles such as data centers, he said, NT's security isn't sufficient.

At New York Life Insurance Co. in New York, the intranet and desktops run on Microsoft software, but nothing more critical than that, said Jim Kennedy, director of computer operations. He said his satisfaction with Microsoft security is "50-50." Microsoft Office 2000 makes it easier to clamp down on Macro viruses, he said, but the constant discovery of holes in Internet Explor-

er is bothersome.

When asked about fixing flaws, Microsoft's answer to users has been for them to upgrade. But at last week's Gartner Group Inc.'s symposium in Lake Buena Vista, Fla., the U.S. Department of Agriculture's CIO, Anne Thompson Reed, refused that answer.

"What do we do with what we have now?" she asked. Microsoft President Steve Ballmer could only respond that the company is working to make software a service that is capable of patching itself (see story on page 20).

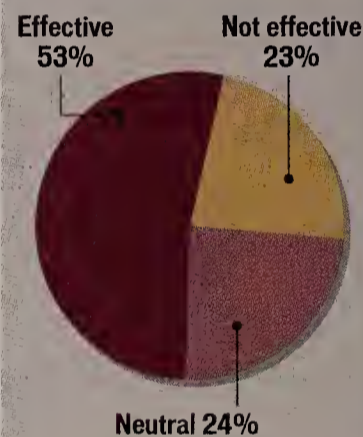
After products are released, Microsoft jumps "as quickly as humanly possible" on reported bugs, said Microsoft Security Product Manager Scott Culp. The company investigates about 10,000 messages per year sent to the *security@microsoft.com* address.

In the case of last week's Internet Explorer hole, Culp said, the company posted an alert and a work-around within six hours of receiving the first report. As of Thursday, however, no patch had been posted.

Windows faces other barriers to improving security, said Howe. Source code is reviewed by few outside Redmond, and all Microsoft patches must be tested in far more hardware and application environments than those of Unix and mainframe vendors. ▀

Security Thoughts

How effective is the security of Microsoft software?



Base: Survey of 75 IT managers at companies with 500 or more employees

SOURCE: COMPUTERWORLD IT INTELLIGENCE UNIT, FRAMINGHAM, MASS.

Web Site Vandals Pose Biggest Threat Online

Analyst: Small hits can pose big hazards

BY SAMI LAIS
LAKE BUENA VISTA, FLA.

Electronic business is toppling internal sabotage — intentional or not — as the greatest threat to networks, Stamford, Conn.-based Gartner Group Inc. security analysts told attendees of the firm's Symposium/ITxpo '99 last week.

"Web site vandalism will constitute the greatest threat," said analyst Michael Zbouray.

The idea was a new one for Reed A. Eichner, CIO at the Cancer Therapy and Research Center in San Antonio. "I'd heard [the statistics] about threats from inside an organization, but the Web page sabo-

tage — I didn't expect that."

That's precisely what the bad guys are counting on, Zbouray said. Nearly unnoticeable changes will have dire financial consequences because of the way Web sites are used, he said.

"People use Web sites to comparison shop, to get to the last three choices, then call to talk to someone and make a choice. Think what effect a change in the price or availability of a product on your site could have," he said.

"With strong change management and integrity checking, one can easily detect such errors after they've happened, but preventing it is a bit more difficult," said Steph Marr, a security analyst at Predictive Systems Inc. in New York.

That's a good reason why

"the day-to-day security monitoring of a company's Web site needs to be done by the organization itself or, through contractual obligations, by out-sourcers whose lives and livelihoods are attached" to maintaining the site's integrity, Marr said.

Internet crimes also will change, Zbouray said.

Credit-card fraud won't be as obvious as Kevin Mitnik's theft of 40,000 credit-card numbers [News, Aug. 16]. Tomorrow's thief will steal more card numbers, but spread the thefts over a month, he said. The thief will transfer a small amount of money from each of perhaps 250,000 accounts. The idea, Zbouray said, will be to create a pattern that's unseen by cardholders or fraud-detection software. ▀

IT Integration Efforts Hurt Raytheon

BY LEE COPELAND

The CEO of embattled defense contractor Raytheon Co. last week said problems in the consolidation of computer systems in recent mergers was at least partly to blame for missed projections and lower earnings.

Daniel P. Burnham said the Lexington, Mass.-based maker of Tomahawk cruise missiles lost focus while integrating defense units from Hughes Electronics Corp. and Texas Instruments Inc. Raytheon acquired Hughes for \$9.5 billion and TI for \$2.95 billion two years ago.

"The consolidation of systems from Raytheon, Hughes and TI was a massive and complex undertaking," Burnham said. "This put a big strain on our people and on our systems. No matter how much planning was done in advance, and the company did a lot of planning, something is always missed."

Raytheon officials said the company missed signs pointing to longer procurement delays, slimmer profit margins on Pentagon contracts and large cost overruns. Raytheon plans to take \$638 million in pretax charges this year and \$30 million more in 2000, a total that is up from about \$400 million announced last month.

"They spent so much time on the integration of those acquisitions that they dropped the ball on running their day-to-day business," said Bill Fiala, an analyst at Edward Jones Co. in St. Louis.

Shawn Narancich, an analyst at D.A. Davidson & Co. in Great Falls, Mont., said, "I've seen other companies where IS systems have been slow to come online and have hurt forecasting. But in this case, it seems to be a lack of understanding of the businesses and lack of communication within the company."

Raytheon expects revenue of \$20 billion this year, \$600 million less than earlier forecasts. It has laid off 17,000 workers since 1997 and plans to cut 2,000 more jobs. ▀

Bug Found in Internet Explorer

Microsoft has credited Bulgarian bug-hunter Georgi Guninski with discovering a major security hole in its Internet Explorer 5.0 browser. The flaw could allow an intruder to read files on a victim's hard drive.

The bug exploits a hole in the browser that fails to restrict scripts, or instructions, to the computer. Such scripts are executed within frames, which are small windows within a Web page.

— Ann Harrison

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BRIEFS

Corel's Cowpland Disputes Charges

Michael Cowpland, president and CEO of Corel Corp., disputed charges filed last week by the Ontario Securities Commission accusing him of violating Ontario securities law. The commission charged Cowpland with using insider information to sell 2.43 million shares of Corel stock for about \$14 million in 1997, commission spokesman Frank Switzer said.

Cowpland said in a statement that he was "looking forward to finally having a chance to clear my name."

Airlines Share E-Tickets

America West Airlines and Continental Airlines Inc. have become the first two U.S. carriers to link their electronic-ticketing systems. The technology lets passengers use electronic tickets when their travel plans include both airlines and lets the two airlines accept passengers with electronic tickets who need to rebook flights.

United Air Lines Inc. in Chicago is expected to link the electronic-ticketing systems of its Star Alliance airline partners.

Sanyo Buys Linux

TurboLinux Inc., a Linux vendor, last week said Sanyo Electric Co. has licensed TurboLinux for the 20,000 medical workstations it expects to sell over the next four years. The workstations were designed for hospitals and clinics to use in tracking medical records.

Threat of Veto Imperils Finance Bill

The Clinton administration last week renewed threats to veto a financial systems overhaul bill, which would allow banks, insurance companies and brokers to merge. The bill came under attack last week by a broad coalition of privacy groups. The veto threat came after House and Senate GOP leaders said they had reached an agreement on competing versions of the legislation.

Intel: Chip Speed Matters

IT managers say 600-MHz PCs not for all but useful for Web graphics, other apps

BY MATT HAMBLIN
LAKE BUENA VISTA, FLA.

INTEL CORP. CEO Craig Barrett defended his company's release of ever-faster Pentium III processors last week, despite complaints about the limited number of applications for corporate users.

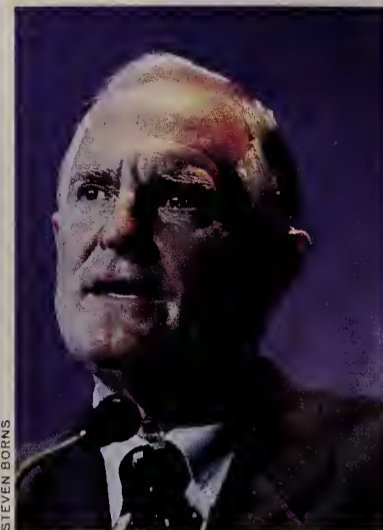
Barrett conceded that 95% of the time, corporate users won't need the latest, fastest processors, as new desktop models exceed 600 MHz. But the other 5% of the time, he said, users might want that faster processor to create a graphics-intensive, Web-based application.

"Unless you buy that capability, you'll never be able to take advantage of that 5%," Barrett told 8,000 attendees at the Gartner Group Symposium/ITxpo '99 here last week.

An informal survey of 10 information technology managers and CIOs here showed that users bought Barrett's message. All said they're not interested in buying the fastest desktops today, but they would consider speedier machines when company replacement cycles call for them.

"Many users don't need a faster machine just to do word processing or e-mail. But some engineers do need speed to move images around," said William Kirby, manager of computer technology at Williams International, a maker of small gas turbine engines in Walled Lake, Mich. "So, I'd say we might tend to buy 600-MHz or faster machines."

Deb Mukherjee, chief technology officer at Farmers Insurance Group of Companies



INTEL CEO CRAIG BARRETT acknowledges that 95% of the time, users won't need the fastest processor

in Los Angeles, agreed. "The question of upgrading for speed has been around forever, and they used to say, 'Why do human beings need to fly?' So, I think we will welcome faster machines because the applications are coming," he said.

Stamford, Conn.-based Gartner Group Inc. analysts were

much more critical of the processor upgrade pathway. They told managers to customize their workplaces with many different platforms and processor speeds, recognizing that most end users don't need faster machines.

Gartner analyst Michael Gartenberg said Intel faces a growing dilemma similar to one that Apple Computer Inc. faced in 1989, when it had processors far ahead of the software demands of the time. "The question is, How does [Intel] sell the concept of faster when it doesn't matter?" Gartenberg asked.

Companies "don't need to upgrade and instead should focus on building a well-managed environment," he said. For example, to run the coming Windows 2000 operating system, companies need desktop machines with only Pentium II 266-MHz processors, not the forthcoming Pentium III 700-MHz, he said. ▀

Study Finds Real Cost of PDAs Six Times Price

Synchronizing time about 40% of cost

BY MATT HAMBLIN
LAKE BUENA VISTA, FLA.

The total annual cost of owning and supporting a handheld computer is about \$2,700, or six times the average purchase price, according to a study released last week by Gartner Group Inc. in Stamford, Conn.

That finding took some information technology managers at Gartner's Sym-

posium/ITxpo '99 here by surprise. But they quickly added that the numbers seemed plausible given the unpredictable nature of handhelds.

"Wow, that's real high" for annual costs, said Steven Engel, manager of network engineering at Minnesota Mutual Life Insurance Co. in St. Paul. Some users said Gartner is traditionally high in estimating costs of ownership, but Engel said "the number is believable because of the lack of understanding of the support needs" of handheld users.

Gartner analyst Ken Dulaney said the time that end users spend synchronizing devices is about 40% of the total cost (see chart). That's based on an estimate of five minutes synchronizing per day. "Even at five minutes per day, this activity is a new diversion of user time that costs enterprises more than they might think," Dulaney said.

Several IT managers said the costs are driven higher because companies don't have an

orchestrated plan for managing handheld devices or for training end users so they can reduce help desk costs.

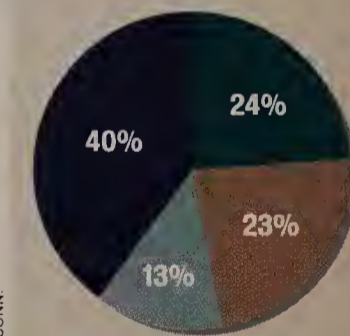
"The personal digital assistant phenomenon has largely caught IS organizations unprepared," Dulaney said.

Dulaney said companies should purchase standard personal digital assistants (PDA) and use server-based synchronization software to reduce headaches and enhance security. But doing so requires administration and money, users said.

None of the IT managers interviewed here said they have elaborate systems for tracking PDAs or policies about what to do if a user tries to steal company data held on a PDA. "You can't prevent people from bringing in their own PDA, but it is harder to take away something that is somebody's personal property if a security problem develops," said Keith Bergman, an MIS manager at rocket motor builder Utah Propulsion Center in Magna, Utah.

Dollar Breakdown

Total annual cost of ownership for handheld device: *



- End-user operation and downtime
- Purchase price
- Administration
- Technical support

*Total annual cost per device: \$2,690

SOURCE: GARTNER GROUP INC., STAMFORD, CONN.

Correction

An Oct. 11 News story ("CA and CSC Sign Truce, Renew Ties," page 4) mischaracterized a 1991 takeover attempt by Computer Associates International Inc. CA's takeover target was The ASK Group, in which Electronic Data Systems Corp. held a majority stake.

Competitive advantage: Windows NT on Compaq

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COMPUTERWORLD
ENTERPRISE BUSINESS SOLUTIONS

CIA Latest to Predict Y2K Supply-Chain Ills

BY PATRICK THIBODEAU
WASHINGTON

The lack of year 2000 preparations at many small to medium-

size businesses located overseas may lead to supply-chain problems for larger enterprises, especially those dependent

on "just-in-time" distribution, a CIA official testified at a congressional hearing last week.

Lawrence K. Gershwin, the

CIA's national intelligence officer for science and technology, also said intelligence officials expect a "safe havening" in the U.S. of financial assets by some foreign governments and firms. Gershwin, testifying before

the U.S. Senate's Special Committee on the Year 2000 Technology Problem, said Russia, Ukraine, China and Indonesia are likely to experience "significant" Y2K failures. Germany and Japan started late with their Y2K repairs and are also at risk of failure, he said.

Gershwin said the CIA was "highly confident" that Y2K failures won't lead to the inadvertent launch of a ballistic missile and that the chance of a nuclear accident on the scale of Chernobyl is "extremely low."

Y2K isn't expected to produce a "significant" disruption in oil supplies, Gershwin said, but breakdowns in foreign infrastructures could affect U.S. interests overseas, global businesses and military bases.

Department of Commerce officials also testified. There is enough time for governments and businesses "to put in place the necessary structure to avoid serious disruptions to the world's trading system," said Michael J. Copps, assistant secretary for trade development.

Too Rosy?

But another witness, Nick Gogerty, an analyst at London-based International Monitoring, said the optimistic Y2K message being put forth by U.S. officials was "potentially reckless" and could prompt some to disregard the Y2K risk.

Gogerty said he expects that the Y2K problem will lead to \$1.1 trillion in damages worldwide, separate from any litigation and insurance costs, and that the U.S. share will amount to about \$115 billion. He also said he believes Y2K will lead to delays in global trade.

But the most serious risk posed by Y2K will be to financial systems. Echoing the CIA's assessment, Gogerty said a "flight to quality" from traditional assets could lead to increased demand for gold and the U.S. dollar.

Humanitarian issues are another significant concern. James Moody, CEO of Washington-based InterAction, a group that represents 160 relief, development and refugee agencies, said the Y2K problem has the potential to seriously disrupt essential services. "Unless prompt, coordinated action is taken," Moody said, the U.S. and other wealthy countries "will come under significant international and internal criticism." ▀

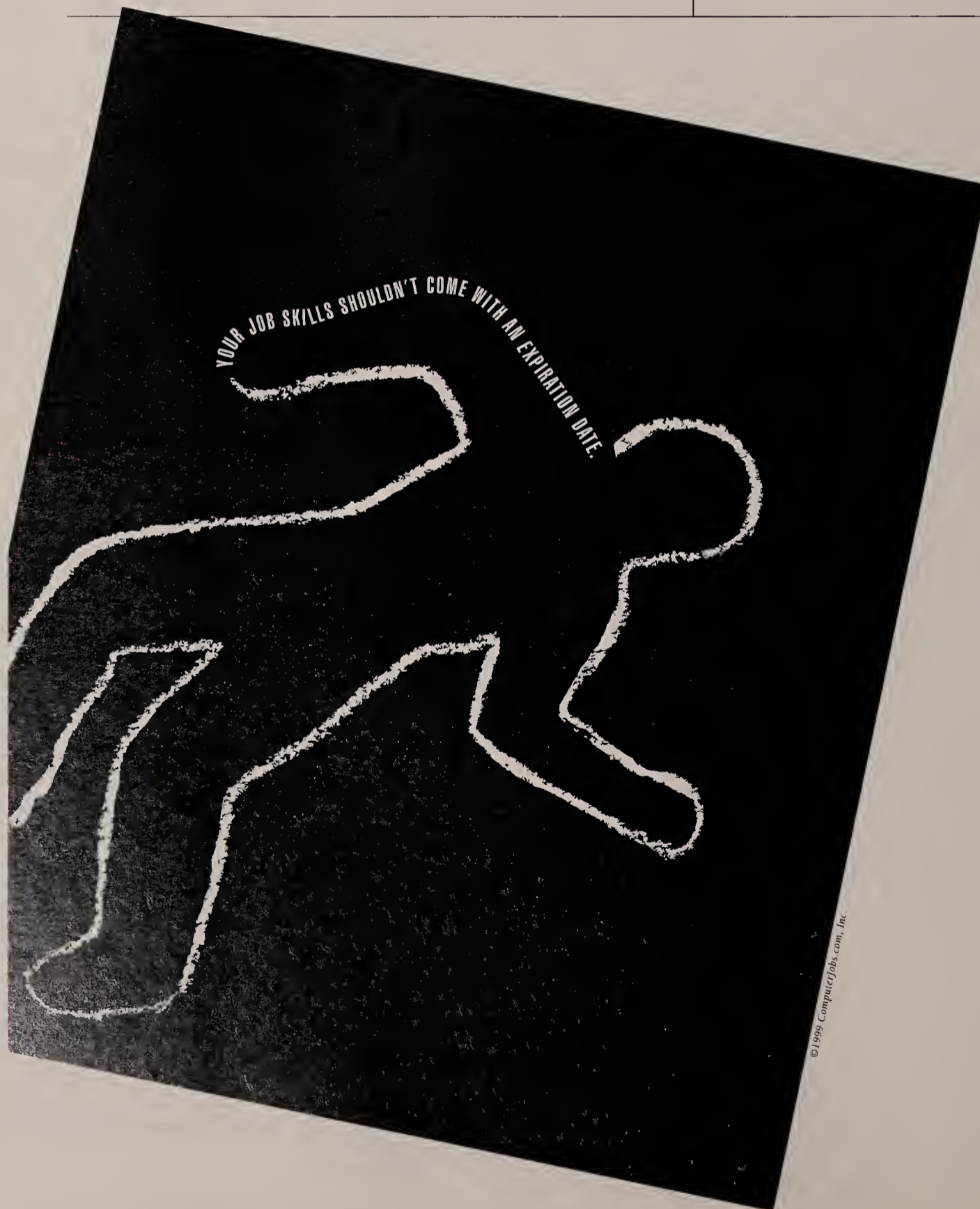
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Technology *BRIEF*

► All ERP Systems Are Not "Created" Equal

By Darren Laybourn

If you read the marketing, and listen to the salespeople, you'll be hard-pressed to understand the difference between ERP systems today. They are all Internet-enabled, and of course, they all work exactly as advertised. But in reality, they don't work as advertised. Creating ERP software is complex and unfortunately, prone to errors. The vendors that can minimize those errors will provide the most long-term value.

The costs of poor quality are extensive: longer implementation times, higher costs due to rework; bad decisions driven from bad information; low employee morale and so on. But quality in ERP systems is a treacherous topic; quality is in the eye of the beholder, and lack of features or platform compliance is just as bad as features that don't work.

At the lower end of the market, the product must be easy to install, easy to use and operationally bulletproof. At the top end of the market, features are king.

In the midmarket, product quality is even more important. The value of an enterprise solution is still tremendous for midmarket customers, but they can't afford to deal with the issues and delays that their enterprise brethren have experienced.

How do you decide what's right for you? Start with these questions:

How do you ensure that your product continues to work from release to release?

A common practice is regression testing, or testing to make sure the product hasn't regressed since its last version. Vendors will perform these tests using manual methods or some form of automated testing tools to record and play back the tests. Automated testing tools enable the vendor to recreate the tests from release to release in exactly the same way.

How do you know you're testing everything?

This is a key point, because it doesn't matter if the vendor has great automated regression testing if it isn't testing all the code. Testing 100% of the software isn't feasible, but the more code tested the better. The vendor

should be able to tell you how much of the product has been tested and describe the methodology used to obtain it.

How do you ensure that the product will continue to perform from release to release?

Benchmarking is the answer. The vendor creates a predefined set of tests, runs them and records the times for important activities. More sophisticated vendors will have automated tools for loading test data, executing the tests and collecting the results. The vendor's ability to repeat these tests with each release will allow teams to continue to perform at optimum levels without unexpected system problems.

What true version of the product are you shipping, and how do you ensure I can use it?

Version numbers are often manipulated for competitive reasons. You need to know the number of product release cycles. The more cycles the vendor has delivered well, the more confidence you can have in your choice. This is a great question for vendor references as well. Ask them how many upgrade cycles they've had with the vendor. In the enterprise space, many customers have never been able to upgrade the products. If you can't upgrade, you won't be able to take advantage of the latest features and technology the vendor offers. You're buying a system that should last five to 10 years, if not longer. Make sure you can get the most out of it.

How do you manage all of these tests once you have them in place?

If your potential vendor has nailed all the questions so far, then this question is critical. For an ERP system, there will be thousands of automated test scripts built and in operation. Those will produce hundreds of thousands of test results, all which must be kept up to date with the latest-known good values for the results.

With each run of the automated tests, the results must be compared, collated and resolved. If your vendor doesn't have robust systems in place to handle this volume of results, you should question if they can maintain it or offer you any new functionality.

How do you make sure that as you grow as an organization your software keeps up?

This is often known as load testing and can be performed several ways. A vendor may ensure that the database can handle the load by simulating user traffic against the database server. They may execute business logic as well as the database; execute the network and the client side code. All these tests are valid and provide different levels of information. What you need to understand is if the system can handle your company today and if it will grow with you. Don't forget that hardware and bandwidth are getting faster by the day, and with cluster technology and faster processes coming, hardware will do a lot for you as well. Don't get tricked into paying too much now to buy a product you won't need for years.

What is your track record for supporting your key platform technologies?

This is a great indication of the maturity of the organization. How fast has it historically been able to make technological shifts? Whether from 16- to 32-bit or SQL Server 6.5 to SQL Server 7.0, the ability to deliver on the latest platforms is a must. It ensures that the vendor has a good architecture and the quality systems in place to allow you to get the most from all pieces of your solution.

How rich is your relationship with your platform vendors?

History may show that the vendor has a good record of accomplishment, which is important. However, what about the future? Is the platform vendor using your vendor's product to test the platform? Is it part of the release criteria for the platform? Does it have the latest information? Is it contributing designs to the platform to enable its success, and is your potential vendor considered a role model by the platform vendor? The richer and deeper the relationship, the more you are assured that your vendor will deliver the best solution possible on your platform of choice.

How often do you release a patch or fix for your product and for what types of issues?

Lots of patch releases could mean



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low quality and could be an indication that the vendor releases code before it's ready. Every new release of the product will cost you time to install and test. If the patches are just fixes to the patches already released, you have an indication that the vendor's ability to regression-test the product is very limited. Software patches aren't all bad. In some cases, the vendor will release features of high importance to you as a customer, and its ability to do that without breaking other things is critical.

If a problem is found with your product, how long does it take to turn around the fix?

This question is almost impossible to answer without knowing the nature of the problem, but vendors can give you an indication of what they have been able to do, and more important, are willing to do. If your business is shut down because of software issues, you need the vendor's immediate attention.

These are just a sampling of the questions you need to ask a prospective vendor. The bottom line is you must make quality an issue in your buying decision. Nobody else will. ►

Laybourn is vice president of research and development at Great Plains.

Banks Cashing In on E-Commerce Services

Bank of America the latest to offer Web site-building with fee-based hosting plan

BY STACY COLLETT

BANK OF America Corp. in Charlotte, N.C., has launched a service to build Internet "storefronts" for merchants. The service will give small and midsize businesses easy access to online retailing, officials said.

It joins a growing list of financial institutions cashing in on e-commerce services. But some observers said banks should leave e-commerce to Web-hosting businesses. They also risk tarnishing their image if services falter.

Bank of America's Internet Order Center, which costs merchants about \$100 per month, can track inventory, collect shipping information, arrange for billing and verify payment. The software used

for the service was developed by EMS Inc., a Burbank, Calif., applications service provider.

"Despite all the hoopla surrounding online shopping, it is still severely hampered by smaller retailers' justifiable concerns about the cost and complexity of handling their online

transactions," said David Archambault, an EMS executive.

Bank of America, with 2 million small and midsize business customers, will compete with Wells Fargo & Co. in San Francisco, KeyCorp in Cleveland and Citibank in New York, which have also launched site-building services.

Wells Fargo teamed with Atlanta-based payment processor First Data Corp. last month to build online storefronts for

Web Assets

Banks cash in on storefront services

BANK	ASSETS	LAUNCHED	FEES
Bank of America, Charlotte, N.C.	\$614B	October 1999	\$250 to install; \$100 per month
Wells Fargo & Co., San Francisco	\$205B	September 1999	\$250 to install; \$45 per month
KeyCorp, Cleveland	\$80B	June 1999	\$250 to install; monthly fee
Citibank, New York	\$2.8B	April 1999	Not available

Calif. Signs Up Digital Signature Provider

Push for national standard continues to broaden benefits

BY MARK HALL
AND PATRICK THIBODEAU
MOUNTAIN VIEW, CALIF.

In a brief ceremony at VeriSign Inc. headquarters here last week, California Secretary of State Bill Jones used his smart card to digitally sign a document designating VeriSign as the first company authorized to provide digital certificate services to state agencies, citizens and businesses.

Jones said his department has already formed a task force to evaluate the feasibility of letting California citizens vote over the Internet, using digital signatures for authentication.

Businesses, however, may be the first beneficiaries of California's new regulations, which are similar to digital sig-

nature efforts in other states.

Brian Gangler, manager of application development and maintenance for the state, said companies are required to submit many signed documents simply to conduct business in California.

For example, companies must file a statement of officers every year, a process that's a prime candidate to move to the Internet, Gangler said.

Thomas Domich, assistant deputy director of administration at the California Parks & Recreation Department, said digital signatures would be a "tremendous help," especially in processing employee travel claims. Claims can be completed on the computer, but they can't be filed electronically. Digital signatures would cut filing and processing times, he said.

But California's measure has its limits. Some businesses, such as Charles Schwab & Co.

in San Francisco, have been urging Congress to adopt legislation that would establish nationwide electronic signature standards and eliminate differences among states.

"Schwab is a national company with a national base. What we need is a consistent and uniform federal standard," said Morrison Shafroth, a company spokesman.

The National Conference of Commissioners on Uniform

JUST THE FACTS

Digital Chaos

The issue: States such as California are adopting legislation authorizing the use of digital signatures

The problem: More than 40 states have enacted different laws dealing with electronic authentication, creating legal confusion

The solution: Businesses are urging Congress to adopt national electronic signature standards. The outlook for such standards remains uncertain

small and medium-size businesses (News, Sept. 27).

KeyCorp, the 12th-largest bank in the country, with \$80 billion in assets, launched its site-building service during the summer. The company builds storefronts for \$250, and customers pay a monthly charge for services they access. KeyCorp partnered with application service provider Econex Inc. in Independence, Ohio, for the service.

Citibank in April launched Citibank Commerce in several Asian countries and in July launched www.bizzed.com for small U.S. businesses.

Some industry watchers said payment processing is becoming a commodity service in e-commerce. So banks are capitalizing on existing relationships and offering more services before another bank or Web service lures their customers away. But banks may have limitations.

"As online businesses get more sophisticated, they're going to demand more sophisticated services, and the banks may not be able to keep up with the state-of-the-art services," said David Schatsky, an analyst at Jupiter Communications LLC in New York.

Steve Owens, owner of SimcoeStick.net, a Rancho Mirage, Calif.-based electronic business that sells leather conditioning products, said outgrowing Bank of America's services is a possibility.

"Right now, [Bank of America] handles up to 1,000 [products]. We only have 30, but we'll be adding," said Owens. ▸

MOREONLINE

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www.computerworld.com/more

Sybase Aims Offering at E-Start-Ups

BY ROBIN ROBINSON

Sybase Inc. will try to steal Oracle Corp.'s market share among e-commerce start-ups with a package of products and services that will get a site up and running within 24 hours for a price of \$9,000.

Oracle last month announced a similar combination of products and services for \$9,995. The package didn't include the training and ongoing support Emeryville, Calif.-based Sybase is offering, nor did Oracle make a 24-hour commitment.

Time-to-market is important but can be outstripped by how serious the entrepreneurs are gauged to be, according to Kamran Mohsenin, founder of Berkeley, Calif.-based Ofoto Inc., his second e-commerce venture. Ofoto, to be launched next year, will offer photo finishing services via the Web.

"We learned that scaling was what this is all about," Mohsenin said.

The Sybase offering includes Java-enabled software, database and installation consulting and around-the-clock technical support for one year. The catch is, Sybase will install only Sybase products.

The service "directly reflects the statement of Sybase at TechWave '99: to get involved in e-business," said Ted Kempf, a systems integration analyst at Gartner Group Inc. in Stamford, Conn. "The demand is so strong that everyone is getting involved in it." ▸

State Laws in Chicago approved in July an electronic signature standard that is now going to state legislatures for approval. Laws that require handwritten signatures "need to be overcome to allow electronic records and [digital] signatures to be the equal" of manual signatures, said John M. McCabe, the conference's legislative director.

If Utah is any indication, actually implementing digital signatures in California won't happen overnight.

Cost and application development issues have limited digital signature use to mostly pilot projects, said Robert Stewart, Utah's digital signature administrator. Utah approved digital signatures in 1995. But, he said, state courts are nearing adoption of digital signatures, and Utah doesn't expect to finish Web-enabling state functions for a few more years.

Widespread use of digital signatures, Stewart said, "is still promise and not reality yet, but we are so incredibly close." ▸

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BRIEFS

Investment in Linux

The Santa Cruz Operation Inc. and Hambrecht & Quist LLC announced last week a mutual investment in The Linux Mall. Considered the most popular Linux site on the Web, The Linux Mall is the sole division of WorkGroup Solutions Inc. Although no specific figures were given, the deal makes SCO and Hambrecht & Quist the largest outside investors, although not majority stockholders.

Priceline.com Files Suit Against Microsoft

Priceline.com Inc. filed a suit against Microsoft Corp. in federal court in Connecticut last week, claiming that Microsoft's name-your-price hotel reservation service offered through its Expedia travel site infringes on Priceline's patent for name-your-price travel.

E-Wallet Has Takers

Microsoft has added an electronic wallet capability to its Passport online authentication service, which lets users purchase products at participating sites without having to type in financial information. Barnesandnoble.com, Buy.com and Dell Computer Corp.'s Web site have agreed to participate.

Short Takes

2ND CENTURY COMMUNICATIONS INC. has agreed to use **CYGNET INC.**'s eBusiness Solution software to offer its Web customers integrated marketing, sales, service and billing processes. . . . **AMAZON.COM INC.** has added **E.PIPHANY INC.**'s E.4 software to collect and analyze data on customers and visitors. Amazon.com will be able to glean the data from existing resources on its servers. . . . **CUNA MUTUAL GROUP** has completed the installation of a 1T-byte Objectivity/DB object-oriented database that will tap into up to 40 data sources and allow more efficient cross-selling of credit unions' financial services. . . . **WASTE MANAGEMENT INC.** announced that Jim Boyle of Perot Systems Corp. has been appointed the company's acting director of information technology. Michael T. Patton has resigned as vice president of IT at the company.

Sun Upgrade Could Be Chance to Bargain

UltraSPARC III requires total system swap

BY JAIKUMAR VIJAYAN

UPGRADE problems between Sun Microsystems Inc.'s UltraSPARC II and its successor, UltraSPARC III, can benefit information technology managers' budgets if they use the opportunity to negotiate more aggressive discounts and trade-in allowances than usual.

A report by Gartner Group Inc. in Stamford, Conn., says customers who move to the

new technology can expect a 75% to 100% performance boost, but upgrading will require a total system swap.

The incompatibility reduces the long-term viability of Sun's existing boxes, and it substantially undermines their residual value when UltraSPARC III systems start shipping next year, said Tom Henkel, the author of the Gartner report.

Sun users aren't unique in this respect.

Similar forklift upgrades are

possible during the next two years as all the major vendors ramp up their server architectures, said Rich Partridge, an analyst at D. H. Brown Associates Inc. in Port Chester, N.Y.

"It's just the facts. . . . You can only use the same architecture for so long," agreed Rex Hays, a design engineer and Sun user at Eastman Kodak Co. in Rochester, N.Y.

Map It Out

Users need to pay close attention to vendor road maps so they don't end up buying loads of expensive, end-of-cycle technologies with few long-term upgrade options, according to Henkel.

In Sun's case, Gartner rec-

ommends that users defer volume server acquisitions, choose smaller servers, if possible, and negotiate at least a 30% discount on all servers. The company also said users should make sure Sun documents any upgrade credits and trade-in allowances that are going to be available in future. "Take a look at your current and planned performance requirements and growth expectations and invest accordingly," Henkel said.

Sun Director Andy Ingram last week said the company is drafting formal upgrade and trade-in terms and conditions for upgrading to UltraSPARC III systems. But he insisted that the upgrade wouldn't be nearly as disruptive or costly as Gartner claims.

Ingram said customers concerned about the financial impact of the upgrade can protect themselves in a variety of ways, like leasing new equipment and signing up for upgrade options. ▀

Health Care Industry Puts Biometric Security to Work

Systems are likely to please doctors

BY JULEKHA DASH

Federal guidelines intended to protect the privacy of patient records stored electronically are expected to be passed this fall. Although one analyst said most health care organizations won't be prepared to meet the standards, a few providers are using sophisticated security such as smart cards and fingerprint or iris scan technology.

Although the details of the privacy and security standards the U.S. Department of Health and Human Services will legislate later this year are unclear, they are expected to require that health care providers monitor and limit access to electronic patient data.

Some health care providers are finding that passwords alone won't provide adequate security and that they're cumbersome for physicians who need to log on repeatedly to access multiple applications. According to a report from Stamford, Conn.-based Gartner Group Inc., biometric identification is the only tech-

nology that will meet proposed privacy standards and win physician support.

Troy Stillwagon, information security officer at Scott & White Hospital and Clinic, a 486-bed facility and integrated health care company in Temple, Texas, said clinical workers must log on an average of 10 times per session to access multiple applications.

But that will change next month when Scott & White begins a yearlong implementation of Privacy Curtain, a fingerprint scanning system from Integrated Visions Inc. in Sebastian, Fla.

Passwords don't provide adequate security, as workers reuse them or write them down. "You can't share fingerprints," said Stillwagon.

The hospital plans to roll out the application and fingerprint scanners on up to 300 workstations per month, eventually reaching 4,000 workstations across 29,000 square miles in central Texas.

Biometric systems have entered health care in the past few months, with a handful of adopters, said Deborah Kohn, a principal at Dak Systems Consulting in San Mateo, Calif. ▀

Intel, AMA to Offer Secure Sign-ons

A plan by Intel Corp. and the American Medical Association (AMA) in Chicago to offer online credentials for doctors who want to send and receive medical information on the Web is a critical step for e-commerce in the health care industry, observers said.

But failure could mean a setback for online health care, they warned.

The online credentials will be available early next year to help physicians and consumers identify who is at each end of an Internet connection when patient charts, lab results or insurance information is transmitted.

Doctors can apply for online credentials through consumer health sites like Healtheon/WebMD in Atlanta, WellMed Inc. in Portland, Ore., and MedQuist in Marlton, N.J., all of which have signed on for the service. The AMA will verify the physician's credentials and set up passwords and verification. Intel will manage the information on separate servers for each credentials provider. Each time the physician sends or receives medical information, the credentials will be rechecked.

The AMA doesn't anticipate charging doctors for online cre-

entials, according to Dr. Richard Corlin, speaker of the house of delegates for the AMA. But details on how Web health sites and physicians will pay for the service are still being ironed out, Intel said.

Healtheon/WebMD said it will accept the credentials for online transactions between physicians and service providers such as hospitals, laboratories and pharmacies. MedQuist officials said its site will use the credentials to store and retrieve patient charts over secure Internet connections.

Some industry observers said the service is a critical stepping-stone for the health care industry, which has lagged behind other industries in adopting Internet technology because of security and budget issues.

"The infrastructure for security needs to be there," said Frederick Rickabaugh, a manager in information security at Ernst & Young LLP in Greenville, S.C. "But once they start, they're not going to get a second chance. If they do it poorly and fail from a security standpoint, it will be a chilling factor for development and could delay the use of the Internet of e-commerce in health care."

- Stacy Collett

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Supply-Chain Planning Benefits Drug Makers

Global challenges discussed at i2 show

BY CAROL SLIWA
LAS VEGAS

NOT SO LONG AGO, when a shipment of Gliadel brain-tumor medication arrived at Rhone-Poulenc Rorer Inc.'s central distribution center in Tinley Park, Ill., there might be no room in the storage freezer.

Today, Rhone-Poulenc Rorer and other drug companies — including several that detailed just-launched projects

at i2 Technologies Inc.'s i2 Planet customer conference here last week — are attacking such problems with million-dollar-plus supply-chain planning products.

Efficiencies and planning

are especially critical in the drug industry, where manufacturers face a variety of challenges. Warehouses aren't usually near plants. Batch drug processing adds an element of uncertainty to production particularly if yields are less than 100%. And drug development cycles can take

years, so decisions to build or remodel facilities must be made long before a product is launched.

In fact, the pharmaceutical industry spends more

on supply-chain planning than 13 other industries studied by Boston-based AMR Research Inc. Eventually, analyst Larry Lapide said, advanced planning and scheduling (APS) software will start to replace

manufacturing resource planning (MRP) systems.

"An MRP system will tell me what I need in order to make a certain amount, but it assumes that I have as much as I need," he said. "An advanced planning and scheduling system would tell me what I can make with what I've got."

Reductions All Around

Bristol-Myers Squibb Co. just went live with two installations of i2's Supply Chain Planner to help products move more effectively across continents from six manufacturing operations. The company hopes to reduce cycle time and inventory, not to mention costs, said Robert Squires, the New York-based company's director of enterprise planning.

In fact, Squires said, the i2 planning software essentially is replacing its SAP AG Master Production Scheduling module.

Merck & Co. will enhance its

MRP package with APS software to help make critical capital decisions for its 26 plants worldwide. Merck also uses i2's Factory Planner to better manage constraints and spotlight bottlenecks. And a schedule that used to take two to three days to produce can now be done in minutes, said Kevin Latham, a senior director at Merck.

Rhone-Poulenc Rorer was having problems every week at its Manati, Puerto Rico, manufacturing plant, said senior in-

formation systems manager Robert Michael. Now the plant and the company's Collegeville, Pa., planning center have access to the same information and can spot problems quicker.

Rhone also hopes that having a single view of its entire supply chain will help ensure that inventory is in the right place at right time. That would reduce the costs of shipping drugs such as Gliadel back and forth between its central and regional distribution centers. ▀

AT A GLANCE

■ In the pharmaceutical industry, a \$1B company would spend about \$800,000 on supply-chain management software

SOURCE: AMR RESEARCH INC., BOSTON

Airport Delays Cost \$825M

BY PATRICK THIBODEAU
WASHINGTON

Flight delays are costing U.S. businesses millions of dollars in lost productivity, as air travelers spend hours waiting in airports because of problems with air traffic control systems, Congress was told last week.

Air traffic delays have cost businesses some \$825 million in lost productivity this year, according to the Air Transport Association of America, a Washington-based trade group representing the major air-

lines. In July alone, an estimated 100,000 air travelers were delayed every day. During the week of June 7 to 13, American Airlines said it was forced to cancel 642 flights because of air traffic control delays.

Critics said the problems are due to poor management and a system that's handling far more capacity than it was originally designed for. The system needs more staff and money.

U.S. Federal Aviation Administration Chief Jane Garvey said the dramatic increase in delays this summer was largely the result of bad weather and the installation of new equipment in its traffic control centers. She said the FAA is fixing its problems with business-like management reforms and equipment investments. The agency is spending more than \$1 billion on new air traffic control systems.

Planning Ahead

For frequent fliers, such as Tom Laub, vice president of client services at Medical Mutual of Ohio, the threat of delays is prompting some travel strategies. Laub spends two weeks on the road each month.

"What I try to do is pick less heavily traveled days, like go on Sunday evening vs. Monday morning and return on Thursday instead of Friday," he said.

Medical Mutual also uses videoconferencing. The system was implemented to save money. Traveling midweek from his company's Cleveland headquarters to Dallas, for instance, cost \$1,300 in airfare. Videoconferencing quickly paid for itself in reduced travel cost. "It's not a total substitute, but it's a good substitute," he said. ▀

Continued from page 1

Aetna

Hartford, Conn.-based insurance giant faces a stress-test treadmill due to continuing losses and systems challenges at Prudential HealthCare.

During its \$8.9 billion merger with U.S. Healthcare, Aetna ran into problems consolidating the customer codes that are used to process customer claims between the two companies, said Ira Zuckerman, an analyst at Nutmeg Securities Inc. in Westport, Conn. That led to delays in paying doctors and headaches for members of the health maintenance organization.

But over the course of that effort, said Aetna CIO John Brighton, the company ended up exceeding its estimates for cost savings from systems integration work by 15% to 20%. Brighton said Aetna finished the integration on time late last year, and the work cut the costs of supporting multiple systems and networks.

Now, Brighton said, he expects to reach the same systems cost savings targets following Aetna's \$1 billion acquisition of Prudential HealthCare, which it completed in August. That deal makes for a trifecta, after the \$1.05 billion acquisition of NYLCare Health Plans last year and the 1996 U.S. Healthcare deal.

However, the Prudential unit faces a financial turnaround. Aetna officials disclosed last month that Prudential HealthCare will report a loss of \$200 million this year, or twice as much as analysts had expected. One consultant at a major consulting firm in New York that works with Prudential HealthCare said the unit "had a notoriously difficult time" keeping track of which of its health plan members were profitable or money-losers.

Still, he and other analysts conceded that moving Prudential HealthCare onto Aetna's computing environment might be the smoothest part of the acquisition, because Aetna now has considerable acquisi-

tion experience under its belt and is moving Prudential's members and physicians — not applications or hardware — into its operations.

The greater challenge for Aetna, said one Wall Street analyst who requested anonymity, is a business forecasting one: its ability to predict future medical costs and price health care coverage affordably to retain Prudential HealthCare's most profitable customers.

For its part, Aetna's information technology organization sent a team of IT professionals to evaluate Prudential HealthCare's IT operations last spring as part of its pre-acquisition scouting — and Aetna used the information it gleaned to create a systems integration plan the company just launched, Brighton said. The team discovered, for example, that the two companies have compatible mainframe and Unix operating environments, along with Windows NT 4.0 desktop machines.

"We make very, very detailed [integration] plans, and we try to anticipate every-

thing," said Brighton, who added that his company's strategy is to migrate Prudential HealthCare's line-of-business units and systems into Aetna's operations over the next two to three years.

When Aetna merged with U.S. Healthcare, it closed the latter's Blue Bell, Pa.-based data center and consolidated those operations into its Windsor and Middletown, Conn.-based glass houses. As part of that three-year effort, which it completed earlier this year, Aetna upgraded to state-of-the-art hardware, storage and disaster recovery equipment, including the installation of IBM CMOS-based Sysplex mainframes, said Brighton.

When Aetna's IT team evaluated the Jacksonville, Fla.-based data center used by Prudential HealthCare, said Brighton, the company saw that it could realize "immediate" and "significant" cost savings by eliminating some of the older IBM 3090-style mainframes and storage technologies that had been used in that facility. ▀

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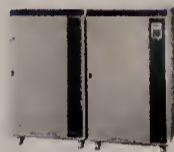
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The Lure of Internet Spin-offs

Companies rushing to join online push

BY JULIA KING

DTE ENERGY CO. did it in hopes of attracting much-needed venture funding as well as top-notch IT workers who might not otherwise be interested in working at an electric utility company. Bank One Corp. saw it as the fastest way to get into the Internet banking business.

Every month, more companies are creating or spinning off separate business units to

focus exclusively on e-commerce and other Internet-related activities. Some of these ventures, such as PCQuote.com, already have gone public, creating an additional source of revenue for their parent companies. So far this year, more than 20 such spin-offs have gone public or have announced their intentions to do so, according to *Red Herring* magazine, an investment publication.

Most of the others, such as Starbucks X, hope to do the same some day. But in the meantime, management can still hold out stock options and the excitement of a fast-paced, Internet-focused start-up op-

eration to attract the best and the brightest Web developers and online marketing professionals.

Separate, Internet-focused lines of business are "much more attractive to IT professionals who want to ride the hottest technology wave," said Karen Rubenstrunk, an analyst at Meta Group Inc. in Stamford, Conn.

The spin-offs also attract big bucks from cash-rich venture capital companies and other backers eager to invest in all things Internet. "There is so much venture capital out there that they don't know where to put it," Rubenstrunk said. "Creating a separate business

unit is one way companies have of getting someone else to fund their electronic-commerce strategy."

Spin-offs also can serve as great turf for information technology professionals looking to advance their own careers. A prime example is David

Lord, who was CIO at Holt Co. before becoming CEO of its dot.com spin-off, Toysmart.com. Another is former Starbucks Corp. CIO Debbi Gillotti, who is now senior vice president and general manager of the company's Internet business unit.

The accompanying chart lists a dozen companies that have created separate Internet-related ventures in the past year. ▀

IT Execs Grill Microsoft President

BY KATHLEEN MELYMUKA AND DAVID ORENSTEIN
LAKE BUENA VISTA, FLA.

In a high-spirited, boisterous exchange with technology executives from customers and partners, Microsoft Corp. President Steve Ballmer last week was peppered with questions about the company's contributions to technology, its commitment to service, its credibility and lingering holes in the Windows NT platform.

Ballmer told attendees at Gartner Group Inc.'s Symposium/ITxpo '99 here that growing the service force is a priority, noting that Microsoft's enterprise consulting services staff has increased from "basically nothing" to 7,000 employees in six years and that 350 customers currently have consultants on-site full time.

Deb Mukherjee, chief technology officer at Farmers Insurance Group of Companies in Los Angeles, complained of upgrade problems. "My boss, who just spent a bunch of money on Y2K, has to spend a lot of money on W2K — Windows 2000. It's painful," Mukherjee said.

An exasperated Ballmer responded, "If you want to do a deployment in Windows 2000, I'll have the number of people it takes to be there every day designing the deployment. If things aren't going well, we'll be there. I'm not going to say we can do what IBM can do, but we're going to have skin in the game."

Mukherjee drew applause

when he listed several technological breakthroughs by a variety of companies, such as Sun Microsystems Inc.'s invention of Java, and asked what Microsoft has done.

Ballmer's response was that Microsoft brings value "in the way we put things together." For example, he said, "a lot of companies will say they invented XML [Extensible Markup Language], but the question is: Who provides the development platform, the services, the glue pieces and the tools to let you link XML and the storage systems to store, find and retrieve them?"

Problems With Planning

A question from Gartner analyst Michael Gartenberg about overpromising and underdelivering on Windows NT drew applause from the audience. "It's fair to say we got ahead of ourselves," Ballmer acknowledged. "Everybody really does want a road map on where we think we're going. If you want to know what we're sure of, we're sure of today, pretty sure of six months from now, reasonably sure a year from now, and then it declines." The problem, he said, is that most corporate planning extends beyond that year.

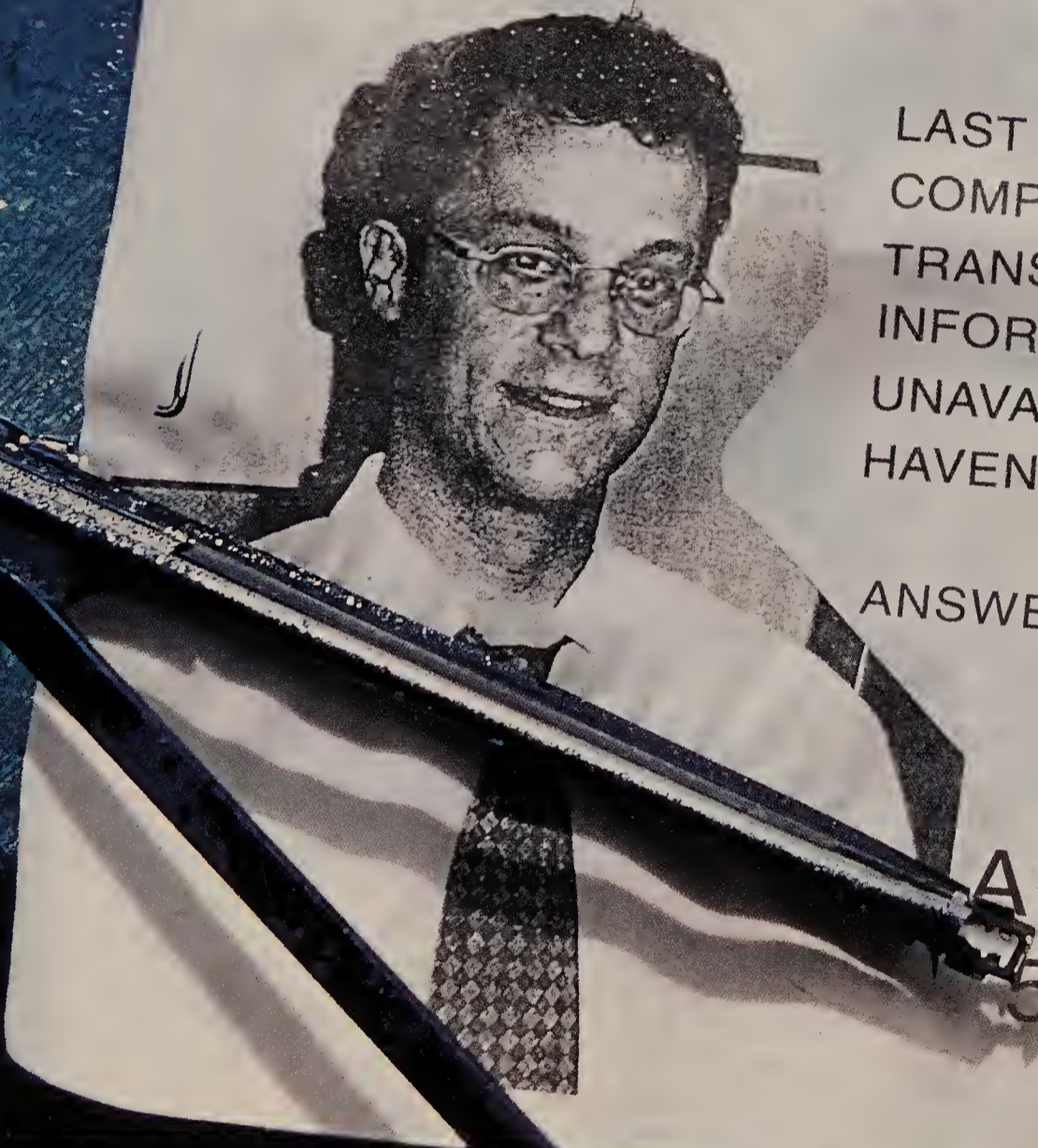
George Orlov, CIO at Pacific Gas & Electric Co. in San Francisco, also complained that NT is still missing critical pieces. "To run in the data center, you need more than scalability and reliability," he said. "You need data management, backup and recovery."

Ballmer pledged, "First we'll catch Unix, then we'll catch the mainframe environment." He predicted that with the help of third-party software providers, Windows 2000 should surpass Unix in those areas about six months after it ships. "Not that I'm telling you to wait," he said with a smile. ▀

COMPANY	E-BUSINESS UNIT	CREATED	ACTIVITIES
General Motors Corp. Detroit	e-GM (www.gm.com)	August 1999	Oversees all of GM's Internet- and e-commerce-related activities, including research and development, manufacturing, Web-based sales and financing
Amway Corp. Ada, Mich.	Quixtar (www.quixtar.com)	September 1999	E-commerce -- enables online ordering by independent Amway sellers
Creative Computers Inc. Elk Grove Village, Ill.	uBid Inc. (www.ubid.com)	1998	Internet-based auction site for computing equipment and other goods
Barnes & Noble Inc. New York	barnesandnoble.com (www.bn.com)	May 1997*	Online book sales
Navarre Corp. New Hope, Minn.	Netradio.com (www.netradio.com)	1998	Online sales of music CDs and other products
Bank One Corp. Chicago	WingSpan Bank (www.wingspan.com)	June 1999	Internet banking
HyperFeed Technologies Inc. Chicago	PCQuote.com (www.pcquote.com)	June 1999	Internet-based real-time stock quote service
Starbucks Corp. Seattle	Starbucks X (www.starbucks.com)	June 1999	Online, direct-to-consumer sales of coffee and other merchandise
Eastman Chemical Co. Kingsport, Tenn.	CustomerFirst (www.eastman.com)	1998	E-commerce and systems integration services
DTE Energy Detroit	DTE Edison America (www.theenergyclub.com)	April 1998	Online energy sales to small business and residential customers in deregulated markets
The Holt Co. Waltham, Mass.	Toysmart.com (www.toysmart.com)	December 1998	Online toy sales
Via U.S.A. San Francisco	eVisa (www.visa.com)	September 1999	Focuses on e-commerce initiatives, including online payments via electronic wallet technology

*ISC announced March 1999

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MultiSync FE750™	17" (16")	0.25mm	1600 x 1200 @ 73Hz	January 2000
MultiSync FE950™	19" (18")	0.25 - 0.27mm variable	1600 x 1200 @ 77Hz	January 2000
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'Hacker' Version of Linux to Go Retail

Distinct feature: Online updates for users

BY DAVID ORENSTEIN

SILICON GRAPHICS Inc., VA Linux Systems Inc. and O'Reilly & Associates Inc. last week announced they will jointly sell a packaged version of the Debian distribution of Linux.

The vendors will charge \$19.95 for the CD and accompanying book, both of which will be available free on the Web. Sunnyvale, Calif.-based VA sells hardware that runs Linux, and Sebastopol, Calif.-based O'Reilly publishes computing books.

The Debian distribution, which is popular among hard-core Linux enthusiasts, is prin-

cipally maintained and supported by a core of about 500 volunteer developers. The distribution is distinct from others for its emphasis on online updates. Users can opt to download the latest version of any component of the code as soon as it's posted to www.debian.org.

Expanding the Demographic

The vendors are promoting Debian to bring it to more users than its hacker audience, according to Brian Biles, a vice president at VA, and Mark Stone, O'Reilly's Open Source editor. "We're not taking over Debian," Biles said. "We're just looking to expand the demographic."

But analyst Stacey Quandt at Cambridge, Mass.-based Giga Information Group Inc., said VA and SGI could also be looking for a distribution of Linux that they can charge to support. The best-selling versions of Linux are supported principally by the distributors themselves, such as Red Hat Software Inc. in Research Triangle Park, N.C. Debian.org, meanwhile, doesn't provide commercial support, leaving a potential revenue stream for VA and SGI, she said.

The Debian distribution is also the core of a new Linux distribution from Corel Corp. in Ottawa. Focusing heavily on desktop ease of use, Corel has been shipping a preview version of its Linux to beta users and the press during

the past few weeks.

Stamford, Conn.-based Gartner Group Inc., however, threw cold water on Linux's prospects as a desktop operating system last week. In a research note, analyst Michael Gartenberg said Linux will be consigned to less than 5% of desktops for at least the next five years. Linux ultimately offers little unique benefit to desktop users, he wrote, and instead could baffle them with its Unix-like complexity and

lack of standards. Despite the availability of several office suites, it also lacks key productivity applications, he added.

But Quandt said Debian distributions won't make major inroads in corporate information technology departments unless it has the blue-chip support that other Linuxes have: the full backing of companies such as Compaq Computer Corp., IBM, Dell Computer Corp. in Round Rock, Texas, and Hewlett-Packard Co. ▀

Afcom Attendees Say Data Center Skills Needed for NT

BY JAIKUMAR VIJAYAN
LAS VEGAS

Windows NT may not have quite scaled into data centers just yet, but mainframe managers are gradually taking on more and more NT system chores.

As NT usage increases, data center skills will be needed to help companies tie legacy applications to Windows NT as well as to provide administrative, management and technical support for critical NT applications, said attendees here at the recent Afcom conference for data center managers.

"The IT system management skills that help you do a good job of managing a mainframe data center are also needed for mid-range" environments such as Windows NT, said Guy Oliva, director of computer operations at Framingham, Mass.-based Natural Microsystems Inc.

It Takes Disciplines

"The baseline disciplines like account management, customer service, security, capacity planning and system planning are [as] critical" for managing Windows NT and other distributed environments as they are for managing mainframes, Oliva said.

The data center at the University of Nebraska in Lincoln provides back-end support for an NT-based data warehouse application, which accesses data from the university's mainframes.

The mainframe staff handles tasks such as changing storage tapes, backing up data and monitoring the connectivity

Working With NT

How data centers are getting involved with Windows NT:

- Interoperability and integration with legacy applications
- Managing and administering Windows NT server hardware for critical applications.
- Providing secure access to mainframe data
- Providing help desk support

Revenue to Set What Web Partner Is Paid

Coach deal signals novel pricing model

BY JULEKHA DASH

When leather goods retailer Coach launched its online store (www.coach.com) last week, it entered not only a new e-commerce venture, but also what analysts said appears to be a unique compensation agreement with its Web partner, Ann Arbor, Mich.-based Fry Multimedia Inc.

Coach, a division of Sara Lee Corp. in New York, will compensate Fry for its Web development and hosting service solely with a slice of the sales generated by the Coach site.

Meredith Whalen, a program manager at Framingham, Mass.-based International Data Corp., said the deal signals a new kind of revenue model that's likely to become a more popular compensation method for firms that deliver e-commerce services.

She noted that the Coach/Fry deal is a permutation of the increasingly popular trend of

shared "risk-reward" pricing models among Internet service providers and their clients. The more common approach, however, has been for companies to offer equity in exchange for services, she said.

Electronic Data Systems Corp., Viant Corp. and Organic Inc. are among Internet services firms that have entered



COACH SELLS purses and other high-end leather accessories

into such agreements, Whalen said.

Other service companies, such as Pandesic LLC, sometimes receive a commission on sales, but such revenue is in addition to development fees, not instead of them.

Preston Dodd, an analyst at New York-based Jupiter Communications LLC, agreed that the Coach/Fry compensation arrangement marks a departure from the usual pricing model. "For a player that size, it's relatively unique," said Dodd.

Though both analysts said a sales-based pricing model is a good way for companies and their Web partners to align information technology initiatives with business goals, such an agreement carries some risk for the services provider. Factors external to the site itself over which the Web services company has no control, such as market conditions or a company's restructuring, could drive down sales.

But Fry Multimedia President David Fry said he isn't worried that the Coach compensation model is risky, given the Coach brand name. Coach sells high-end leather accessories such as purses and briefcases.

"Coach is an entrepreneurial company open to this type of model," said Fry, who added that the unique pricing model was both companies' idea. ▀

between the NT servers and the mainframe, said Douglas Evans, a lead operator at the data center.

The data center at AIM Management Group Inc., a Houston-based mutual fund manager, faces a similar responsibility. A migration to Unix and Windows NT servers for some financial applications has resulted in the data center managing and administering NT servers for various user departments, said Wil Smoot, data center principal at the company.

Similarly, data centers at companies that use NT servers to access mainframe information must deal with additional security issues, said Judy A. Portock, manager of computer operations at Phelps Dodge Corp. in Phoenix.

"There is a lot more smaller equipment that data centers are now responsible for" because of NT's growing influence, said Leonard Eckhaus, president of Afcom, an association for data center professionals. ▀

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Exam to Find Techies In General Population

Tests liberal arts students on technical prowess

BY JULEKHA DASH

AT ANY GIVEN TIME, John Rudin, CIO at Reynolds Metals Corp., is struggling to fill 20 to 30 information technology positions — up to 10% of his 300-person workforce.

One recruitment challenge: Rudin says he wants technology-savvy candidates who can also communicate, think critically and perform analysis for today's evolving "biz-tech" jobs. As early as next spring, finding such candi-



JOHN RUDIN: The Tek.Xam is a "step in the right direction" for recruiting

dates might get easier. Why? Because of a new exam that tests liberal arts students — those often better versed in so-called soft skills — for computer skills and the ability to use technology to solve problems. Rudin was one of about two dozen human resources and IT professionals who helped design the exam.

Later this week, college students at 70 schools nationwide will take the Tek.Xam, a five-hour computerized test co-developed by high-tech venture capitalist Mark Warner and The Virginia

Foundation of Independent Colleges. It has already been piloted at 25 schools in Virginia and Maryland, with a pass rate of about 30%.

Tek.Xam director Paul Sankovich hopes to have a final version of the exam ready for all higher education institutions to administer next spring.

Barbara Gomolski, an analyst at Gartner Institute in Eden Prairie, Minn., said that while technology certification exams are certainly not new, Tek.Xam is the first specifically "geared towards a non-techie."

Marilyn Reznick, vice president for education at New York-based AT&T Foundation, the telecommunications company's philanthropic arm, said this type of certification exam would reduce the time and money companies spend training new hires in basic technology skills, such as spreadsheet use, Web design and word processing.

Companies are "desperate for some way of assessing these kinds of [technology] skills," said Reznick, whose organization helped fund Tek.Xam's development with a \$300,000 grant.

Moreover, given the IT labor shortage, Tek.Xam is a "step in the right direction to getting more people interested in IT jobs," said Rudin.

And while many IT jobs in the past

Techie Test

Examples of what liberal arts students are asked to do on the Tek.Xam:

- Use a browser and search engine to find answers to specific questions; determine the bias, quality and perspective of Web site's creator
- Answer general questions about technical terminology, problem-solving in a technical environment and telecommunications and network application terms
- Create a multipage working Web site, a multislides presentation and a word processing document
- Analyze raw data, draw conclusions, create a spreadsheet and graph pertinent data into another presentation format

have been filled by non-computer science majors, the need for such people is greater today. "The old perception was that you had to be a techie in the IT arena. [Today] we're all becoming IT people," said Rudin.

But some hiring managers said the exam may not influence their decisions. Barb Lyman, IT recruiting manager at Standard Insurance Co. in Portland, Ore., said her company rarely hires recent college graduates, so it's unlikely that an exam would sweeten a candidate's chances of working for the firm.

She added that even a job on the help desk requires at least one year's experience — and that experience would sway her more than an exam. ▀

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Fitting Web Pages on Tiny Screens

\$30,000 software will
convert content to fit
on any mobile device

BY MATT HAMBLÉN

Getting handheld computers to display Web pages is a big hassle: Web content developers have to write code to shrink each page to fit the tiny screen.

But now Riverbed Technologies Inc. in Vienna, Va., has developed software rules that will reside on a company's server and convert Web content to fit on the screen of any mobile device.

The software, called ScoutWeb, was announced Oct. 6 and will ship later this year for \$30,000 per server.

Open Sky Networks Inc., a start-up wireless Internet service provider in Palo Alto, Calif., is considering using ScoutWeb, said Pat McVeigh, president of Open Sky, which is funded by 3Com Corp. The goal is to offer wireless ac-

cess to any Web site via any handheld device, including some smart phones.

With the wide array of handhelds on the market and the many smart phones on the way, making a Web site available to all users would be a headache for Web content developers, McVeigh said. The size, color quality and gray scales of handheld screens vary widely.

"It's very important technology for companies that want to provide access to Web content in any format," said analyst Jack Gold at Meta Group Inc. in Westboro, Mass.

ScoutWeb can be used to interpret any site by default standards, picking text over graphics and wrapping columns to the appropriate width for each handheld, McVeigh said.

Riverbed officials are targeting companies that want to give mobile employees and trading partners access to their Web sites. Default rules can be refined to download only the most important information. ▀

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BRIEFS

PeopleSoft Purchases CRM Vendor Vantive

PeopleSoft Inc. in Pleasanton, Calif., last week said it would buy customer relationship management vendor Vantive Corp. in Santa Clara, Calif., for about \$433 million in stock. Through the acquisition, PeopleSoft will offer e-commerce applications that can track customers throughout their purchasing life cycles, the company said.

Intel Sales Up but Lower Than Expected

Intel Corp.'s third-quarter revenue was up 9% to \$7.3 billion, but earnings didn't live up to Wall Street's expectations. The chip maker last week reported net income of \$1.9 billion before acquisition-related costs, up 21% over last year's third quarter. That fell 2 cents short of the consensus estimate of 57 cents per share, as calculated by Boston-based First Call Corp.

SAP Says It Will Fall Short of Revenue Goal

SAP AG last week warned that its promised 20% to 25% revenue increase probably won't materialize. Instead, the German software vendor predicted its revenue would increase by 15% to 20% over the previous fiscal year. SAP's third-quarter revenue increased 7%, but SAP didn't provide further details.

Storage Results Vary

Network backup company Exabyte Corp. in Boulder, Colo., reported \$17.5 million in losses for its third quarter ended Oct. 2. It had \$53 million in sales, compared with \$72.8 million last year.

Meanwhile, Seagate Technology Inc. reported a \$2 million profit for the first quarter of 2000, compared with a \$30 million loss for the same period in 1999. Seagate, based in Scotts Valley, Calif., tallied \$1.68 billion in sales, up from \$1.55 billion in the same quarter in 1999.

Earnings at network storage vendor Storage Technology Corp. in Louisville, Colo., will fall significantly below predictions, the company said. Details are expected Oct. 28.

IBM to Focus on Selling PCs Direct

Personal Systems Group will look to Web

BY LEE COPELAND

IBM'S TROUBLED PC unit recently announced plans to cut costs through layoffs. But the computer giant also plans to trim some reseller sales from its business model and put greater emphasis on direct, Web-based sales.

Off the bat, IBM said, it expects to reduce head count by 5% to 10% from its personal systems group of 10,000 employees. The business unit, which has both enterprise and consumer divisions, lost \$1 billion last year.

To right its balance sheet, IBM said it plans to follow in the Web footsteps of Dell Computer Corp. in Round

Rock, Texas, and offer better direct sales support to customers.

"We're taking a whole new approach to how we sell," said spokeswoman Trink Guarino. "We plan to streamline our marketing model, with increasing emphasis on direct sales and the merging of our consumer marketing team with the rest of the marketing team."

Guarino said a growing number of purchasers represent home office users who have the same requirements as business users, thus eliminating the

need for separate marketing messages and sales tracks.

IBM said 60% of purchases from its e-commerce site, Shop IBM (www.ibm.com), were personal systems group prod-



WAYNE HASTINGS, IT manager at DTE Energy Co. in Detroit, approves of IBM's focus on direct sales

ucts. The company said it wants to drive \$6 billion worth of overall product sales through the site by year's end.

Although the personal systems group division lost \$150 million in the quarter ended June 20, it has posted revenue gains of 52% over last year, according to IBM.

Information technology customer Wayne Hastings, an IT

manager at electric utility DTE Energy Co. in Detroit, lauded IBM's move.

"There is no real supplier to corporate America online, except Dell," said Hastings. "You have to have the online option to get into the game. Once you're in the game, it's a matter of product, and that's where IBM has a chance."

Hastings' IT fleet includes approximately 8,000 PCs, a quarter of which get replaced annually. He also added that while users regularly request IBM's ThinkPad laptop computer, he avoids purchasing through channel outlets.

"Purchasing through middlemen is an aggravation instead of a benefit," he quipped, citing problems with order accuracy, delays and returns associated with reseller sales. Hastings buys directly from Dell.

Industry analyst Rob Enderle at Giga Information Group Inc. in Cambridge, Mass., said he expects the personal systems group to take some cues from the success of IBM's profitable ThinkPad group. "The notebook organization at IBM has grown share and remains very profitable and demonstrates that IBM can compete in this business if they have the right management group," he said. ▀

Intel Wins Round in Case

Intergraph patent claim dismissed

BY JAMES NICCOLAI

A U.S. District Court ruled last week that Intel Corp. didn't infringe on technology patents held by workstation vendor Intergraph Corp. as that company had claimed. However, the chip giant still faces antitrust charges in the case.

District Court Judge Edwin Nelson, in reconsidering an earlier plea by Intel, ruled that Intel does in fact have a license to use the technology disputed in the case, thanks to a 1976 cross-licensing agreement it signed with National Semiconductor Corp., which has a controlling interest in the patents.

Nelson granted Intel summary judgment with regard to the patent issue and dismissed that part of Intergraph's case.

Intel still faces the serious charge that it behaved anticompetitively against Huntsville, Ala.-based Intergraph and violated antitrust laws. An Intel spokesman said Nelson's

ruling may help the company with that portion of its case, expected to go to trial in June.

"It takes a significant portion of the case away for us," said Intel spokesman Chuck Mulloy. "It will allow us to focus on the antitrust portion of the trial."

Intergraph couldn't immediately be reached for comment.

In its lawsuit filed in 1997, Intergraph claimed that Intel used several Intergraph patents in the design of its Pentium processor. When Intergraph tried to enforce its patent rights, Intel cut off access to information and samples of products that Intergraph needed to build its products, the plaintiff has charged.

Intel doesn't deny that it played hardball with Intergraph but said its behavior wasn't anticompetitive. Intel has argued that it should be entitled to protect its intellectual property by refusing to do business with a company that has sued it for patent infringement. ▀

Nicolai writes for the IDG News Service in San Francisco.

Motorola Sales Rise

BY JACK MCCARTHY

Motorola Inc. matched Wall Street's expectations in the third quarter, posting earnings of \$332 million, up from \$40 million for the same quarter last year.

Strong sales of digital wireless phones in the quarter and the restructuring of the semiconductor and digital communications business during the past year accounted for the improved results, Motorola President Robert Growney said in a statement.

The electronics company reported sales of \$7.7 billion for the quarter ended Oct. 2, up from \$7.2 billion in sales for the

same period the year before.

Motorola sales in the personal communications segment were \$3.1 billion, up 37% from the same period last year. Semiconductor product sales were \$1.6 billion, up 11% from the same period last year. Government, commercial and industrial segment sales were \$1 billion, up 5% from the same quarter last year. In contrast, network systems sales of \$1.6 billion were down 17% from last year's third quarter.

One analyst said Motorola's overall quarter was positive. "Particularly strong were digital handsets, which accounted for 89% of all wireless phone sales for them," said Pete Peterson, an analyst at San Francisco investment bank Volpe, Brown, Whelan & Co. ▀

McCarthy writes for the IDG News Service in San Francisco.

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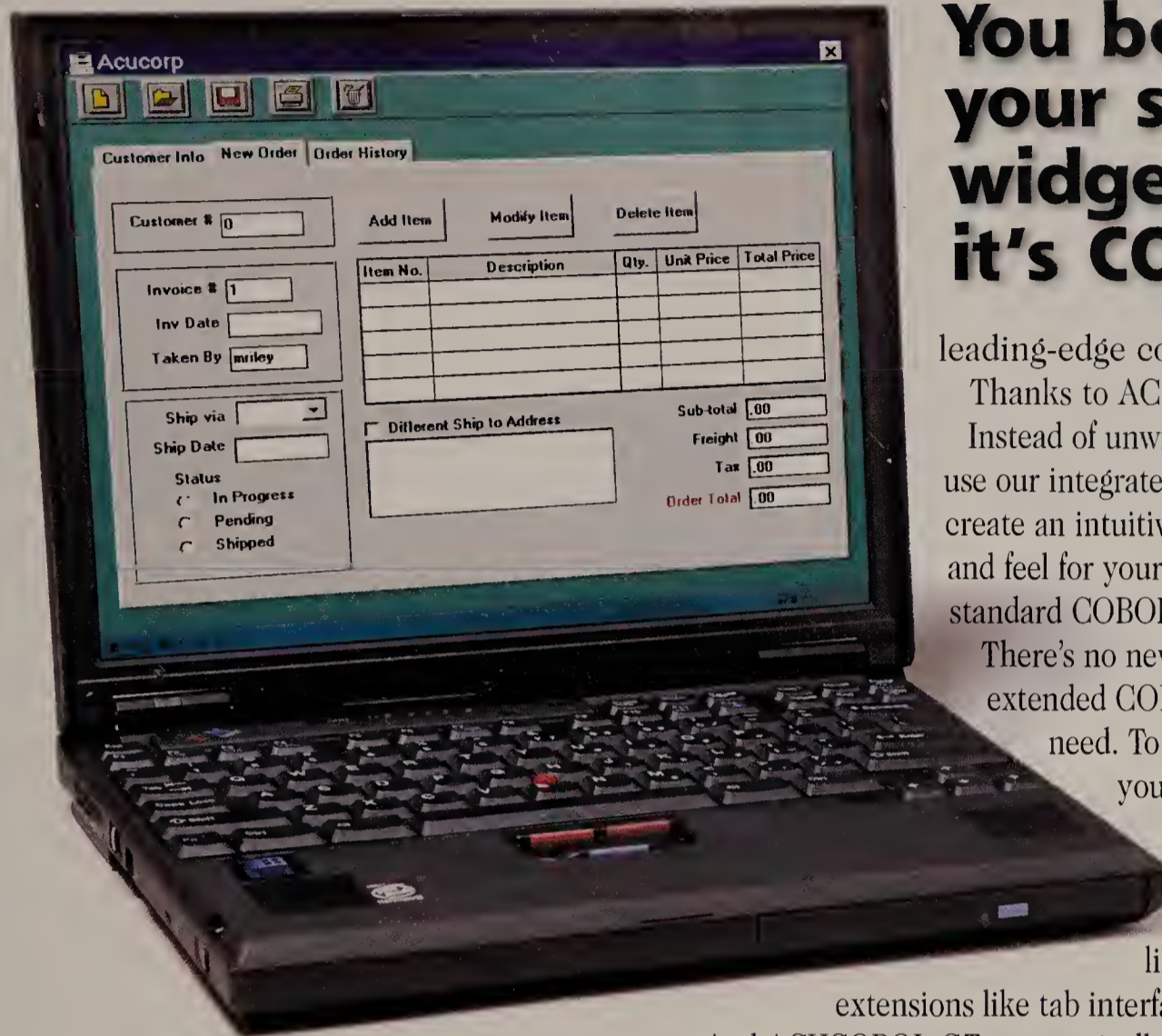
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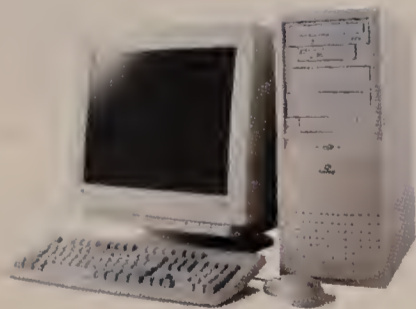


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MARYFRAN JOHNSON

Political arithmetic

WHAT A SHAME, I thought, as I read last week's Page One story about the Immigration and Naturalization Service's screwup in granting visas for foreign-born IT workers ["H-1B Miscount May Alter '00 Quota"].

What a shame the INS didn't have a Russian software expert on staff. After all, Russian programmers rank among the world's leading IT workers on legacy systems and would easily have spotted the alleged flaw in the INS's out-of-date program. Perhaps then those bumbling public servants who keep tabs on that politically bankrupt, inadequate annual immigration quota wouldn't have miscounted 10,000 or 20,000 beyond this year's cap of 115,000 H-1B visas. I shudder to think how much rampant technical competence invaded our shores as a result of that blunder.

The timing of this highly politicized gaffe couldn't be worse for IT hiring managers everywhere. With year 2000 projects winding down, long-delayed projects are coming to life again. Tens of thousands of technology jobs sit unfilled now, and similar numbers will be created in the next few years as e-commerce shapes the business model of our future.

But instead of leadership from Congress,



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now preparing to debate raising the visa limit to 200,000, we'll probably hear another round of thinly disguised, racist arguments from yahoos about "protecting" jobs for American workers and calls to subtract those extra visas from next year's quota — arguments the industry should oppose with all its political muscle. It's abundantly clear to any IT hiring manager that we don't have enough Americans with the right skills to fill these jobs — despite

bogus statistics trotted out by groups who oppose granting these six-year work visas.

Yes, it would be swell if our universities responded more effectively to the high-tech labor shortage. And yes, Congress should approve generous tax credits for corporate employee training in IT areas, and blah-blah-blah. But how dare we consider ourselves citizens of a global economy if we insist that our best technology talent must have an American face instead of a Chinese or an Indian or a Russian one?

What a shame, on all of us. ▸

DAN GILLMOR

Just another amazing week in Silicon Valley

SEVEN DAYS, four events, one valley. I rarely need reminding that Silicon Valley is pre-eminent in the technology arena — the housing prices do that handily. But a recent week's worth of gatherings, almost literally in my backyard, provides a remarkable industry tour.

Here's the itinerary:

We start with the Embedded Systems Conference in San Jose's convention center. The show is bigger than ever. Booths spill out into the hallways and even fill a tent outside the building.

Embedded systems are finding their way into all kinds of products, for the simple reason that a smarter product is a better product. I use at least 20 computers — chips embedded in everything from my microwave oven to my car — before I get to work on the average weekday morning. Network-centric appliances and devices are the coming thing, if the Internet-oriented prototypes at the show are any evidence.

Next up is Computer Professionals for Social Responsibility's (CPSR) annual meeting and conference, held this year at Stanford University. Stanford has seeded brains in more Silicon Valley start-ups and big companies than anyone can count. But CPSR is the antithesis of the valley's culture, for the most part. Its members have a high geek quotient but are more concerned about the social, economic and political impact of the technology than amassing vast riches or power. The highlight of the gathering is a presentation of an award to the open source and free software movements — held in a courtyard outside the William Gates Computer Science Building.

Then it's over to Cupertino, where Steve Jobs unveils the latest Apple computers and software in an auditorium filled mostly with cheering Apple employees. They have a lot to cheer about, and so does anyone who cares about ease of use, style and genuine consumer choice. The latest iMac models are nicely refined versions of the ones that have become so popular over the past year. And Apple's latest operating system update, Mac OS 9, has some extraordinarily useful Internet tools.



DAN GILLMOR is technology columnist at the *San Jose Mercury News*. Contact him at dgillmor@sjmercury.com.



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Storage Networking: Trends for 2000

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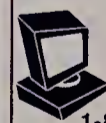


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Storage

Networking: Trends for 2000

By
Robert C. Gray,
International
Data Corp.

Is persistent storage an oxymoron? Storage products, with their mission to retain or keep data fixed and static, are undergoing enormous change. To remain successful, players in the storage market will have to stay on top of important trends. The cost of storage, for example, has decreased 40% per year over the past five years.

Today's storage trends can be understood by first looking at the changing environment in which storage is designed, manufactured, sold, used and serviced.

In the 1950s and 1960s, only the current batch job was stored online. By the early '90s, client/server computing replicated programs and data for efficient application performance rather than for efficient use of the disk drives. International Data Corp.'s (IDC) research shows that the value of stored data is now increasingly about individual productivity and wider user access. More and more, new data means new storage capacity — without removing the "old" data. Fast and reliable data access is mandatory, even if it means replication of the data.

Storage Environment: Changes with Broad Impact

What follows are the key external influences driving storage trends:

- Emerging interconnect technologies.
- The Web; it has become the world's largest library.
- Quality of service is better supported with local storage caches than with larger communications pipes.
- Storage expansion for new information is becoming cheaper than purging and house-cleaning.
- The dominant use of storage capacity is shifting, from the desktop to the set-top entertainment box.
- Ubiquitous networking is providing lower costs, better performance and unique functions. Applications and storage will increasingly be at the end of a longer wire at centralized locations, instead of in your PC or on your LAN.
- More applications are accessed continuously and are in the critical path of revenue and profits. Multiserver, complex, multiorganizational applications are becoming the norm. E-commerce, e-business, e-auctions and e-opensource are everywhere.



Robert C. Gray, research director of worldwide storage systems research at International Data Corp., is responsible for the firm's research agenda on storage subsystems, storage management and subsystem architecture. He executes and oversees market and technological forecasting and consults regularly on tactical and strategic product and market issues. Gray's technological expertise includes Fibre Channel, NAS, SANs and RAID. He can be contacted at rgray@idc.com.

Storage Connections are Changing and Getting Faster

Newer storage connections, such as FICON, Fibre Channel, Ultra-160/m and System IO, communicate at 100M byte/sec. or faster between the storage device and the server. Driving this trend are high-speed servers, which have I/O demands that scale proportionally with CPU speed. Doubling the CPU speed requires doubling the I/O rate. FICON and Fibre Channel provide interconnections based on optical technology that allows server-to-storage distance to be as much as 10 kilometers today and promises upward of 100 kilometers in the near future.

In addition to high speed, these new interconnects allow many more storage devices to be connected on a network. This will ease cluster creation and bring high-end features, such as remote-mirroring, to much cheaper systems in the future. The newer connections also have functionality that is enabled only by software. The supporting software is rapidly evolving, but the surrounding software isn't as stable or as readily available as the software for the SCSI interconnect. On the horizon, there are gigabyte and higher-per-second proposals. Storage interconnects are expected to continue to evolve and increase in performance as long as the need for speed increases in server I/O as well. New storage suppliers include Vixel Corp., Ancor Communications Inc., Brocade Communications Systems Inc. and Gadzoox Networks Inc.

Web Puts the Brakes on Optical Storage

The Internet has had a positive impact on storage demand. What's a bit less noticeable is the impact the Web has had on read-only optical storage. Static data that was

formerly distributed on CD-ROM is now frequently accessed directly from the Web. Benefits include faster updates, central access control and access monitoring. This trend will continue to negatively impact read-only rotating storage. Phone directories, legal libraries and software updates that were formally distributed on CD-ROM are more often distributed over the Internet. Emerging Web caches may be an application for optical technology where the removable media has an advantage.

Storage Substitutes for Network Bandwidth Bottlenecks

Web caching came out of countries such as New Zealand where there has been a demand for Internet access without the onerous costs of high-bandwidth undersea cables. The country's solution has been to keep copies of Web content that hit New Zealand's shores and refresh the data only as needed. Continuously declining storage costs of 40% per year, Internet access demands that are doubling every three months and relatively stable wide-area network (WAN) costs have led to high growth in replicating Internet content. Web caching is the electronic equivalent of the local library: Popular content gets to the cache; some content suppliers pay to have their data pushed to the caches; and some data, such as regional information, is kept in the cache by local policy.

IDC sees significant growth in data replication in two other areas. RAID is increasingly deployed as RAID 1, and multiple-mirroring is a growing requirement for high-end RAID. Lotus Notes is another example of a major use of storage for data replications. In all cases, the cost of storage is less than the payback from faster and more pre-



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dictable data access. IDC forecasts that data replication and caching will grow to more than 10% of the multiuser storage market. Suppliers include Network Appliance Inc., Sandpiper Networks Inc., Inktomi Corp. and SkyCache Inc.

Storage Becomes a Constantly Growing Resource

The best place to store information today is in a computer's storage system, which can be flexibly manipulated and made accessible to a wide range of people. The capital cost of electronic data storage is lower than paper or microfiche. It isn't economical today to spend a lot of money to purge old data. Users will tell IT that the data might be needed in the future and is very valuable. But the result, in the extreme, is that everyone wants everything to be kept online. So new data means added storage capacity.

That creates an opening for software tools that purge outdated data. The demand is one of the forces driving storage-area networks (SAN) and the creation of such infinite capacity storage vaults as Grau Software GmbH's InfiniStor. Drive-capacity upgrades are increasingly common for server storage during its lifecycle. And scalability is an increasingly important purchase consideration. Suppliers such as EMC Corp. routinely ship 10T-byte configurations, a trend that will continue.

Digital Entertainment Storage Use

Exceeds Information and Data Processing Use

Once upon a time, all the storage was in the corporate computing center, and the business units added applications and servers in distributed environments. Most of the installed storage capacity was in the department servers,

then desktops moved the capacity to the users. IDC believes that consumer application of digital storage in entertainment units will shift to the center of storage use once again. While today's PC uses 5G to 15G bytes of storage, the coming video set-top box caches/digital VCRs will need 50G to 500G bytes to meet the future capacity expectations of consumers. Video and sound storage use will dwarf all IT applications, much as mainframe storage capacity is now less than 5% of all server storage. TiVo and Replay TV are pioneering products.

Ubiquitous Networking Enables Storage Utilities, Vaults and Other Remote Fee-Based Storage Applications

When was the last time you kept your money under the mattress or advocated security of the corporate liquid assets in the head office? It seems a totally absurd thing to do, yet that's exactly what we've been doing with our data assets. We are keeping them "under the bed." IDC sees evidence that secure, highly available networking and high bandwidth will change where electronic data resides. Microsoft's Intellistore for Windows 2000 is an interesting example of remote storage. In addition to protection of the data, Intellistore promises to make your data available to you from anywhere - without the need to carry around your own special computer. Intellistore functions by retaining all data and user context on remote servers. Client computers merely cache data and context as needed. When a user logs in at a new location, the server-based data and context is migrated to a network location with minimum network hops between the server and client. Much as banks give interest on money deposits, remote storage will



increasingly be seen as the better option. IDC research also shows that consolidated, efficiently managed storage is much cheaper than distributed storage.

Applications Move to Continuous Operation and into the Revenue and Profit Stream

The era of being able to shut down an application for maintenance is coming to an end. Because of e-commerce, storage must support applications around the clock. Access to the end-user application must be possible from anywhere in the world, from all time zones. In addition, the macro application (such as e-commerce, enterprise resource planning, supply-chain management and others) is increasingly complex, involving multiple servers and databases. More of the end-user applications are directly part of the organization's mission and deliverables. The robustness and availability of mainframe enterprise-level products are rapidly decreasing in price and increasing the demand on midrange and even entry-level server storage.

Trends Inside the Storage Market: The Changes You Can Expect

Faced with the external pressures and changes described, the resilient and highly customer-oriented storage suppliers are responding with investments in hardware, software and services certain to bring important solutions. There will be key changes in available products and in what is purchased over the next five years.

The following are the major trends in storage:

- New technologies will bring much better capabilities and higher value.

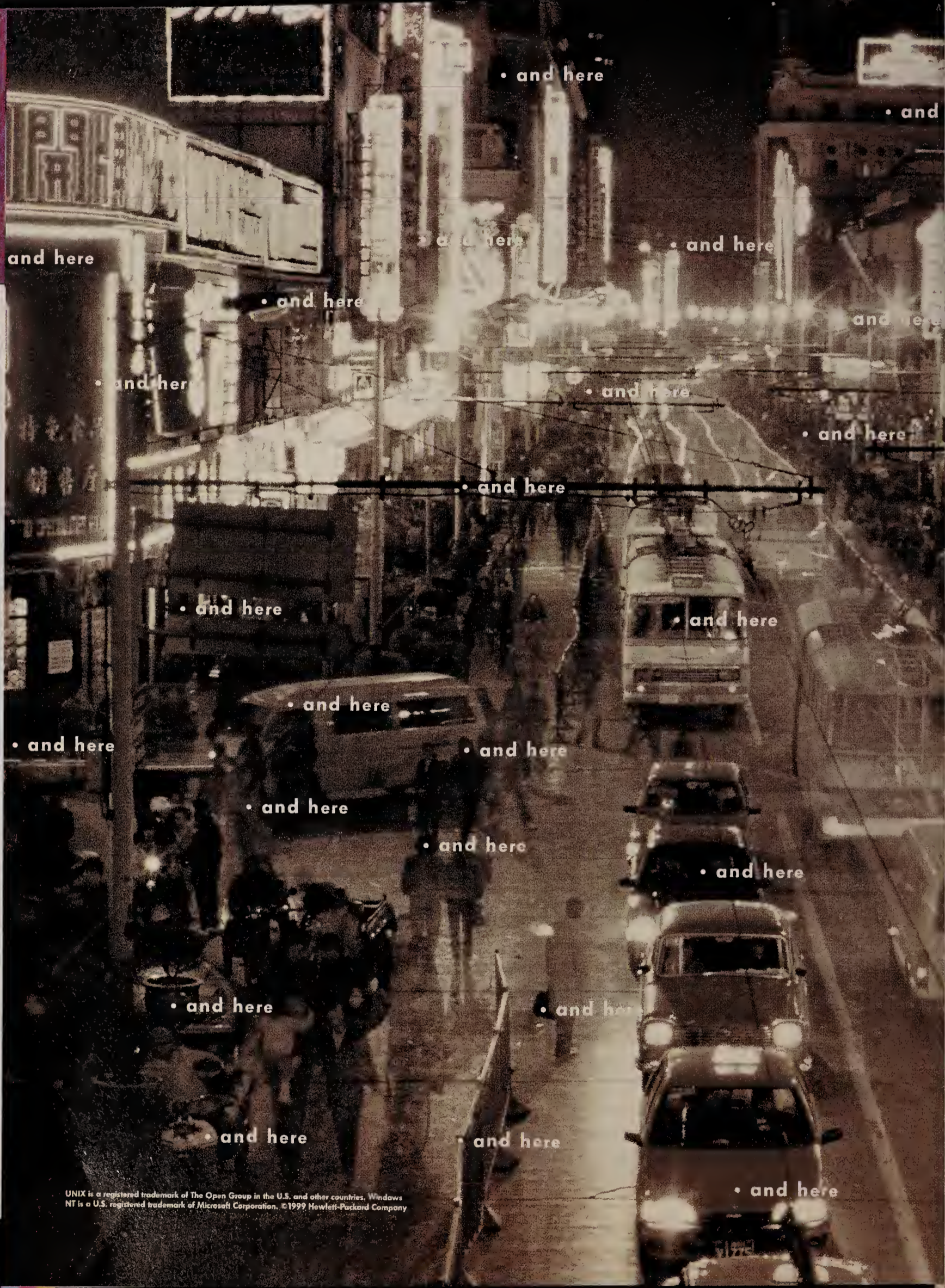
- New classes of product will be available to meet your specific needs.
- New suppliers will enter the market to offer greater and broader choice.
- Suppliers will focus on new classes of storage buyers.

New Storage Technologies

First and foremost among disk storage trends is the forecast for a continuing decrease in price per megabyte and an increase in disk capacities. By 2003, 100G-byte drives will be common, as will prices of 2 to 3 cents per megabyte for high-availability complete storage systems. While magnetic media will dominate the market, continuing investments in optical storage technology may well yield new cost-effective, high-capacity product categories over the next few years.

In the future, networking technology will move directly into storage. The general-purpose networking concepts and issues will become part of the storage world. Fibre Channel switched fabric will be the dominate interconnect, but the recently proposed "Server I/O" standard will also be a 2.5G-bit technology between servers and storage. Use of optical interconnects will rise as costs decline and software brings benefits of campuswide data pools to users.

Virtualized storage systems will be an increasingly common methodology for compatibility, interoperability and new functions. "Virtualization" is the concept that the storage system mimics a storage product already known to the server/operating system. Most RAID systems use virtualization to hide the physical placement from the apparent placement of data within the array. More advanced virtu-



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alization had been used with compression in Storage Technology Corp.'s Iceberg to gain more capacity without adding disk drives. Virtualization is entering tape products for improving speed, load balancing and dramatically increasing tape data density. Expect virtualization technology to enable hierarchical, near-infinite storage systems.

New standards and protocols will be adopted. This will bring openness and multisupplier interoperability to emerging SANs, Web caching servers and general storage management. Expect that the proprietary capability will proceed standardization to market. Examples are the ongoing work of the Storage Networking Industry Association (SNIA) (see Q&A, page 14), the Fibre-Alliance sponsored by EMC Corp. and Sun Microsystems Inc.'s Jiro environment.

New Classes of Storage Products

Every year, the server storage market gets more complex as suppliers endeavor to more specifically meet the broad needs of server storage. Ten years ago, there was fundamentally one product, JBOD (Just a Bunch of Disks), then combinations of disk drives with specific parity protection were categorized as levels of RAID. RAID is now an expected server storage option. End users are being pummeled with an entire set of new acronyms and product concepts. You can count on buying storage with higher-availability characteristics, storage that supports multiple operating systems and more storage that is separate and distinct from your server procurements.

At the very bottom of the storage system price-point is the network-attached disk (NAD). A NAD has an RJ45 con-

necter for Ethernet, instead of a SCSI or ATA connector. The single brick assembly will perform as a file server on your network with simple administration. While models today from Meridian Data (now part of Quantum), Intel Corp. and Nortel Networks cost \$700 to \$1,500, prices will drop below \$500 by 2003. For remote office and small-office backup and image copying, NAD can't be beat for form factor or value.

For small servers, IDC expects suppliers will offer ATA-based RAID. Protection from disk failure is becoming important in \$2,999-and-under and \$3,000-to-\$5,999 server price bands. ATA drives cost 50% less per megabyte than SCSI or Fibre Channel disk drives. With speeds of 7,200 rpm, the low price of ATA RAID is increasingly compelling. ATA RAID won't offer the hot-swap function in most implementations, but for small servers without the need for 24/7 uptime, not losing data and being able to perform off-hours maintenance has high value.

Suppliers and end users have noticed that most entry-level and nearly all midrange and high-end servers exist in a network environment. Almost no server exists alone; servers exist in groups. This realization, and the difficulty of managing so many servers and storage systems, has led to the concept of network storage. We have already noted the NAD version of network storage. Larger aggregations will come in two flavors: storage-area networks (SAN) and network-attached storage (NAS). SAN and NAS are often confused. From an application view, think of both as complementary technologies that help end users consolidate storage to make it more manageable. SANs consolidate

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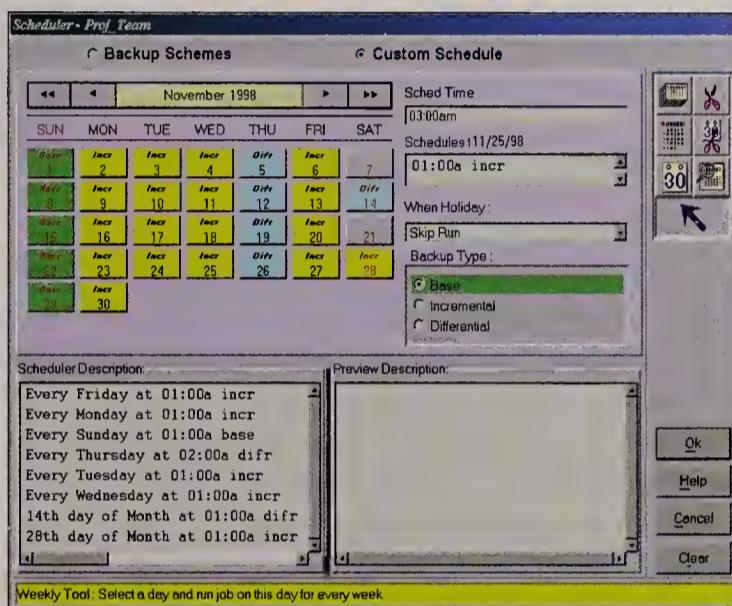
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data center storage and NAS technology consolidates LAN file-serving storage. Technically, one can distinguish NAS from SAN by determining where the network is located in relation to the file system (see Figure 1 below).

In this three-box representation of any computer system, notice where the file system is relative to the network. If the network is between the application server and the file system, the product is NAS. If the network is between the file systems and the disk storage, then the product is a SAN. IDC forecasts that 50% of all server storage purchases in 2003 will be either NAS- or SAN-based. Both product

assumes a Fibre Channel network, multiple storage arrays, multiple servers and block-level, file-level and storage management functionality in one fast, data-moving box. IBM's recently released Shark is an example. Independent suppliers ConvergeNet, DataCore and Troika Networks are among the companies that plan to release such technology or to strike OEM deals with larger suppliers. Storage servers have the mainframe storage directory as their genesis. Watch for high-end continuous operation capabilities to migrate into open systems through storage systems.

Transparent Web cache, like NAD, is a storage system

Figure 1

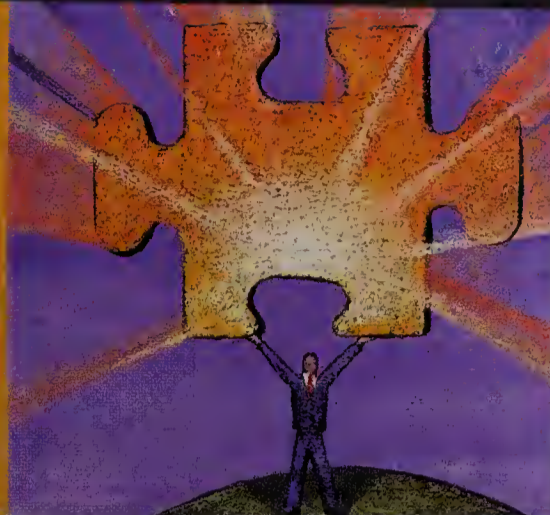


Source: International Data Corp., 1999

categories will have high sales growth during the next few years as end users struggle to find ways to manage the storage capacity growth. SANs will provide LAN-free and application-server-free backup, flexible virtual storage, and eventually, application accelerators.

Another product category of storage servers is also emerging. Think of a storage server as RAID, NAS and SAN in a box. The vision is a flexible, clean-slate design that

stands alone without an explicit direct server connection. Web caches are what the local library is to book publishing. You wouldn't expect to go directly to the author for a copy of a book. Transparent Web caches keep copies of frequently used or vanity-published Web content in a disk storage system near you. At first glance, this supplies you with faster and more consistent access (better quality of service) and cuts the cost of expensive WAN (Internet)



links. At second glance, when coupled with the Network Domain Server (NDS), the cache is a means for value-added services such as one-to-one advertisements, implementing corporate Web access policy, limiting juvenile access to adult sites and providing priority access for a fee. Suppliers such as Network Appliance Inc., SkyCache Inc., Sandpiper Networks and Inktomi Corp. represent the variety of approaches to this product area.

New Storage Suppliers and Customers

Watch for new names in the list of storage suppliers. Recently Nortel Networks' NetGear and Intel have announced NAD products. Expect other networking infrastructure suppliers like Cisco Systems Inc., middleware software suppliers like Computer Associates International Inc. and Veritas Software Corp., and disk suppliers like Seagate Technology Inc. to introduce storage products in new categories. Choices will increase each year. In the traditional RAID market, IDC expects the recent trend toward consolidation of smaller suppliers will continue, while new suppliers emerge within those product categories.

Consumers of storage will shift. The most dramatic change will involve providing the storage requirements for content of a converged-data-voice-video infrastructure. Content producers and distributors will consume much storage. The distribution infrastructure of telcos, Internet service providers and application service providers will increasingly require utility-grade storage systems designed to the unique requirements of central offices, POPs (Points of Presence) and regional storage farms.

Although IDC doesn't have a separate forecast for this

sector, we make note of several of its parts. The transparent cache market is expected to be more than 10% of the total server storage market by 2003, and consumer set-top box, digital VCRs/program caches will be important. Also we expect that home entertainment storage needs will be in the hundreds of gigabytes, while the information and computer programming storage requirements will remain an order of magnitude below that.

Future Speculations: It's a Brave New Storage World

By 2004, storage will be a whole new ball game. Consider the impact of the following highly probable storage-related environments:

- Storage that follows you – access to your information and other information anywhere, anytime. Think of the Web on steroids — wireless and knowing from Global Positioning Systems exactly where you are.
- Storage that knows more of your history than you do – your history in detail constantly added to by your every transaction. This brings up privacy and legal issues.
- Storage that supports, assists and entertains you – and is you – if you're a computer, that is.
- Storage as a utility and service – where capacity looks nearly free: What would you store? What would you want to deliberately purge and destroy?

Storage capacity will be more reliable, more flexible and cheaper. And you'll have more of it. Tools to manage the information will be more automated and will work at higher levels of abstraction. The storage may be owned and maintained by some other specialized organization and located far from you. ▶

Terms to Know

Storage Networking: The use of a network connection to send data between systems and storage devices.

SCSI: (small computer system interface). Pronounced "scuzzy," SCSI is a parallel interface standard for attaching peripheral devices to computers. SCSI provides data transmission rates of up to 80M byte/sec.

SAN: A storage-area network is a system for interconnecting and allowing different kinds of storage devices to be shared by all users through network servers.

SAS: SAN-attached storage is storage elements that connect directly to a SAN and provide data access services to computer systems.

NAS: Network-attached storage is disk storage that connects directly to a messaging network via a LAN interface such as Ethernet. A NAS storage element consists of an engine, which implements the file services, and one or more devices, on which data is stored.

Fibre Channel: An interface technology for transmitting data between servers and storage devices at a rate of up to 1G bit/sec. Fibre Channel connections allow the devices to be up to 10 kilometers apart.

Q&A SNIA's Bill North

Bill North is chairman of the Storage Networking Industry Association's Education Committee. He talked recently with *Computerworld's* Custom Publishing group about the SNIA and its growing role in the storage networking industry.

CW: Tell us about the SNIA. How did it get started, and what's its mission?

North: The SNIA was launched more than two years ago to address the needs of the burgeoning storage networking industry. It's a not-for-profit group currently made up of more than 120 companies and individuals who represent the various facets of the storage networking industry. The group draws together IT professionals, developers and integrators who want to bring reliable storage products and services to the broader marketplace.

Our mission is to promote the use of highly evolved, widely accepted storage network systems across the IT community and make products from multiple storage networking vendors efficient, complete and interoperable. We're committed to delivering standards, education and services to achieve that.

CW: What's the group working on now?

North: The SNIA has a number of different technical efforts under way, including working groups on storage network management, disk and tape storage resource management, data mover technology, object-based storage, backup and file systems. We also announced at our spring conference new initiatives that support education and technology, and increase awareness and acceptance of storage networking technology and solutions within the IT community.

CW: Where is the group heading in the next few years?

North: The SNIA is becoming more global. Our first SNIA-Europe event was held in London this year, and we're hoping to add a SNIA-Asia operating center in the future. We're continuing to serve the industry with a mix of conferences and educational events, and acting as a major forum to develop and review storage networking standards.

Our fall conference features sessions on multivendor storage network standards, SAN deployment, digital data delivery, the data center and e-commerce.

Also, we're transitioning the group from a volunteer-constrained, vendor-based focus to a new model that can respond to the needs of the international IT community with a full-time staff and a broad mission to develop conferences, education and interoperable standards for heterogeneous SAN and NAS technologies.

CW: Tell us about the Education Committee. What's your group responsible for?

North: The SNIA Education Committee was formed to develop and deliver effective educational materials regarding storage networking solutions, benefits and technologies. By doing this, we hope to raise the level of understanding within the information technology community and accelerate the adoption of storage networking.

CW: And what's your group working on now?

North: We're currently working on a set of guidelines for SNIA educational content and putting together a detailed education plan for our offerings over the next couple of years.

One of the first things we will deliver is a glossary of storage networking terms that we hope will help eliminate confusion and promote better understanding through the use of common language within the industry. Ultimately, we expect to offer a set of courses that make up a formal accreditation program for storage networking professionals. ▀

Reading List

*Designing Storage Area Networks:
A Practical Reference
for Implementing Fibre
Channel SANs* ▶

(The Addison-Wesley Networking Basics Series)

By Tom Clark (Paperback; 224 pages; First edition; September 1999; \$19.95; Addison-Wesley Publishing Co.)

DESIGNING STORAGE AREA NETWORKS

TOM CLARK



The Complete Guide to Data Storage Technologies for Network-centric Computing



Computer Technology Research Corp.

◀ *The Complete Guide to Data Storage Technologies for Network-centric Computing*

By Franklyn E. Dailey Jr. (Paperback; 242 pages; First edition; December 1997; \$275; Computer Technology Research Corp.)

The Holy Grail of Data Storage Management ▶

By Jon William Toigo, (Textbook binding; 322 pages; First edition; August 1999; \$49; Prentice Hall)



Fibre Channel For Mass Storage



Ralph H. Thornburgh

◀ *Fibre Channel for Mass Storage*

By Ralph H. Thornburgh (Textbook binding; 155 pages; First edition; April 1999; \$45; Prentice Hall)

Source: Amazon.com



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The tour circles back to the annual Microprocessor Forum in San Jose, where announcements and arcane talk fly thick and fast. Intel and AMD are heading down different paths, we learn among other things, when it comes to 64-bit architecture. But the undercurrent is whether AMD, which keeps coming up with brilliant designs, can outlast its seemingly perpetual manufacturing miscues.

What do I miss by staying in the Valley this week? A big Internet show in New York. That's OK. The Net pervades our little tour, as it pervades everything going on in Silicon Valley these days. You can't be everywhere, though the Net helps you be many places. For this week, staying home is the smart move. ▶

DAVID MOSCHELLA

Larry Ellison to IT: You're becoming obsolete

"The fact of the matter for Oracle applications is we do want to sell to business people as opposed to IT people. We think it is a little bit strange that business people aren't involved in this stuff. They, quote, 'can't understand it.' ... [We say], 'Well, no problem, Mr. Customer, you need to hire some people who speak technospeak. If you want to buy our products, you have to hire people who are experts in talking to us.' And we think this is kind of the old way of doing things ... that it's so complicated to get the infrastructure up and running, you need this army of professionals.

"In this new generation, ... we can now say this is how our purchasing works and we talk to the purchasing people. ... The business people are the ones who should understand what we are selling and the ones who should make the decision to buy or not buy." - Oracle CEO Larry Ellison at his Internet World press conference, Oct. 5

LARRY ELLISON IS SENDING a message to IT professionals all around the world. He is saying that large central IT departments are becoming obsolete. Few forecasts could be

more important to the IT industry. But is anybody really listening?

It's easy to dismiss the seemingly endless series of pronouncements coming from the oracle of Redwood Shores, especially after his network computer fiasco. However, although it's true that network computer hardware has thus far failed miser-

ably in the marketplace, Ellison's central theme that smart networks will be used to support dumb, browser-based devices — though certainly not unique to him — was right on target and is now conventional industry wisdom.

Similarly, while Ellison was clearly not the first person to forecast a shift away from packaged software and toward Web-based services, he is now actively leading the movement. More interestingly, Ellison is, as far as I know, the first CEO from an established enterprise software vendor to explicitly state the unavoidable conclusion that application service providers present a real alternative to the traditional IT department. Last May, I wrote a column that also said this. But it's one thing to hear this from a rabble-rousing pundit and quite another from one of your most important suppliers.

And yet many IT professionals still act as if a major shift from software to services is just idle speculation. I suspect that's because so many large IT departments have been shielded from the early signs of change. Consumers and small busi-

nesses are already moving at a stunning pace toward an almost completely services-driven IT environment. Similarly, for reasons of culture, cost, simplicity and, most important, speed, many leading dot.com companies such as eBay are now opting for the Web services approach. It's quite possible that corporate IT will be among the last groups to realize what's really going on.

Too often we think of outsourcing in terms of letting someone else deal with our old applications. But what happens to legacy applications is typically just a trailing indicator of change and thus shouldn't be used as your main Web services yardstick. It's all the new applications that will never be built in-house that signal the real services revolution, and these applications will be driven by business decision-makers and the application service providers who serve them.

You may think that Larry Ellison is once again overstating his case, but, more likely, it's your traditional packaged software suppliers that are overstating theirs. ▶

READERS' LETTERS

Like 9/9/99, Jan 1. will prove uneventful

HERE'S A PREDICTION for you: On Jan. 1 and the following days, we'll find that the Y2K problem is no more than a minor annoyance, though there will probably be some minor, easily fixed glitches. The bug will have been fixed by businesses, predictably, as the deadline approached.

How could it be otherwise? Businesses are run by people, after all, and so many of us are deadline-driven, getting off our duffs only when there is no way to put things off any longer. Any manager or executive with responsibility for systems understands that he will probably be out of a job if his systems experience major problems caused by Y2K.

Reporting on Y2K has been mediocre at best. Some reporters thought it was somehow a Cobol problem and not a problem of data representation.

The brouhaha surrounding April 9 — day 099 of year 99 — turned

out to be a big yawn, as did 9/9/99 (or should I say 090999?). The arrival of 1/1/00 will be similarly uneventful.

Howard A. Karten
Randolph Mass.
howard.karten@channel1.com

Computerworld could use more Apple

I HAVE NOTICED a general lack of coverage in *Computerworld* of all things Apple. An Aug. 23 article on Universal Serial Bus commented on Apple's use of USB. In fact, if it weren't for Apple abandoning prehistoric serial ports, the USB market would be a mere shadow of what it is now.

Another article said Microsoft and Intel are "spearheading" plans to abandon serial ports and floppy drives, though Apple abandoned the floppy drive over a year ago in its iMac product and now in all of its products.

More recently, on Sept. 20, the QuickStudy on 64-bit processors did not mention Motorola and its upcoming G5 processor, which will also pro-

vide native support for 32-bit applications and be much smaller and use less power than Intel's Merced chip.

Now, I understand that a vast majority of the business world lives with Intel and Microsoft technology, but it would be nice if, as journalists, you could provide some balance and write positive and insightful articles about the huge strides Apple is making in the market.

I thought the iBook was very newsworthy, yet I seem to have missed the *Computerworld* article on it and it's breakthrough Airport (802.11) technology.
Christopher J. Morin
IS manager, purchasing Southwest Metal Fabricators Inc.
Milwaukee

Easy solution for IBM's OS/2 problems

IF IT IS TRUE that IBM is again (for the nth time) pulling the plug on further development of its desktop version of OS/2, thereby pronouncing the death of the operating system

(as implied by Stardock, a Minnesota-based desktop software company that was reported as saying its negotiations with IBM on adding functionality to the software had come to an end), why doesn't IBM open up the OS/2 source and give it away, à la Linux.

This would take the problem away from IBM, allow enhancements to be made by the community that wants them and breathe some fresh life into an operating system that deserved better than it got — perhaps enough new life to give even Microsoft a bit of a jolt.

And what an opportunity for renaming the product: OS/2000. Now that has a ring to it!

Trevor Roberts
Newport, New South Wales, Australia

COMPUTERWORLD welcomes comments from its readers. Letters shouldn't exceed 200 words and should be addressed to Allan E. Alter, columns editor, Computerworld, PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax: (508) 875-8931; Internet: letters@computerworld.com. Include an address and phone number for immediate verification.



DAVID MOSCHELLA is an author, independent consultant and weekly columnist for *Computerworld*. Contact him at dmoschella@earthlink.net.

MICHAEL CUSUMANO

Mozilla gambit reveals risks of open sourcing

THERE HAS BEEN MUCH ado recently about the open-source movement following the success of the Linux operating system and the Apache Web server. However, Netscape's sorry experience with open-source software development — it has yet to finish the next version of its browser — reveals how messy this approach can be for a public company.

Netscape jumped into the open-source model last year by giving away its browser source code (the "Mozilla release"). Netscape hoped that software developers around the world would suggest improvements, helping it compete with Microsoft.

Initially, outside developers responded enthusiastically and downloaded hundreds of thousands of copies in a few weeks. Netscape received bug fixes and some feature suggestions, leading managers to predict that open source would speed up development of Navigator.

Yet problems emerged, delaying development at a time when Netscape's browser share has fallen below 40%. Open sourcing

isn't the only cause: Since America Online's acquisition of Netscape, the departures of key Mozilla team members have contributed to product delays. However, Mozilla's development process has created difficulties that the truly open software initiatives, Linux and Apache, haven't experienced.

First, because Netscape remains the corporate owner of the source code, what Netscape does is not really "open." Netscape insists on owning and distributing the software on its own terms. As a result, few outside developers have been willing to spend a lot of time writing code for Mozilla because they can't control its distribution or usage.

Outside developers have also found it difficult to understand the complex Navigator code base. The product grew from a few tens of thousands of lines to more than 3 million lines by Version 4. Netscape rushed those versions to market and lacked time to adequately modularize the code. Much of the code still resembles a pile of spaghetti — tough for anyone to unravel.

A more fundamental problem: Netscape can't control people who aren't employees or subcontractors. Any features that Netscape people want in the new version within a particular time frame,

they need to develop themselves. They can't wait for the outside world to produce them spontaneously. So most developers working on Mozilla still are Netscape employees. In addition, the Mozilla team has had to throw out tentative schedules whenever it decided to accommodate time-consuming suggestions from the outside.

The unpredictability of open-source development matters little for Linux and Apache because these are the products of international movements, not for-profit corporations. (Netscape and Microsoft differ from companies like Red Hat, which make money by offering versions of open software with easy setup and fee-based technical support.) Linux and Apache have committees and a process to introduce changes to their code bases. But no for-profit entity owns the Linux or Apache code or has to schedule releases that go head-to-head with Microsoft in a market struggle.

The bottom line: Open-source development hasn't helped Netscape keep the Navigator browser alive, and it may not be an effective way for any commercial company to manage product development. It is similar to a free lunch, and we know what those are worth. ▀

ANN HARRISON

America can learn from Germany about privacy

THE ORGANIZERS of the Chaos Communication Camp, who hosted a camp-out for 1,300 hackers outside Berlin this summer, appeared to be a relaxed group of people. Reclining on the lawn outside the main Hacktent, they noted a few relatively minor concerns.

The portable toilet company was overdue for a pick-up. Registration staff were on the lookout for thieves. And a suspected group of French intelligence agents appeared to be videotaping the event, despite a no-photography rule.

Absent was any overt paranoia about surveillance by German authorities. They may have been present. But Andy Muller-Maguhn, a member of the Chaos Computer Club, which organized the event, said the hacking community doesn't have an antagonistic relationship with the government. In Germany, strict rules on data privacy and the absence of encryption controls — both of which are supported by many hackers — are accepted policies, enshrined in law, for keeping the government in check.

"The ruling party listens to us," said Muller-Maguhn. "They are responsive to the total needs

of the society, not just those of law enforcement."

Almost makes you want to move to Germany. Our government resists passing strong data privacy laws and subjects the export of strong cryptography by U.S. firms to "technical review," which could be used to compromise products. Then there are the continuing calls for key escrow systems, which would give investigators access to encrypted data.

Unlike Germans, Americans are accustomed to assuming that their government will take any opportunity to violate their privacy. That explains why, when the Federal Intrusion Detection Network (FIDNET) was proposed in August, critics overlooked the potential usefulness of the proposed system. Any broad government IT initiative that focused on intrusions should concentrate on plugging widespread security holes, not merely detecting them. But such a system, built by commercial contractors, would be ill-suited to conduct the covert government surveillance some feared it was designed for.

The distrust surrounding FIDNET should be focused on the Echelon surveillance system, which already taps phones and online communications around the world. Perhaps FIDNET is intended to distract inquiries into Echelon, the electronic surveillance network operated by the National Security Agency and its intelligence allies.

Either way, Europeans are again way ahead of Americans in pursuing sound information policies. The European Parliament commissioned a report on Echelon following charges it was being used to conduct industrial espionage against European governments and businesses. Shortly after the report was submitted, the German Federal Ministry of Economic Affairs and Technology announced that it considered the use of strong cryptography "a crucial requirement for citizens' privacy, for the development of electronic commerce and for the protection of business secrets."

In the wake of the outcry against FIDNET, some analysts suggest that the specter of covert surveillance may encourage businesses to begin encrypting all their data traffic. While the U.S. government's actions may have made Americans even more concerned about their privacy, the recent proposal to lift encryption export laws seems fatally compromised by accompanying proposals for protecting investigators and software companies. These proposals could let the government gather data through holes in commercial encryption products and shield law enforcement from saying how it decrypted data used in a court case.

Although the Germans have been slower to engage in e-commerce, they at least have clued-in state agencies like the Berlin Data Protection Commission, which recently held a symposium to discuss the merits of online privacy. The European Directive on Data Protection, which forbids the transfer of consumer data to countries with weak privacy rules, is already making U.S. companies wrestle with the merits of privacy laws. Let's hope the German government's support for uncompromised encryption also has a positive impact on U.S. policies. ▀

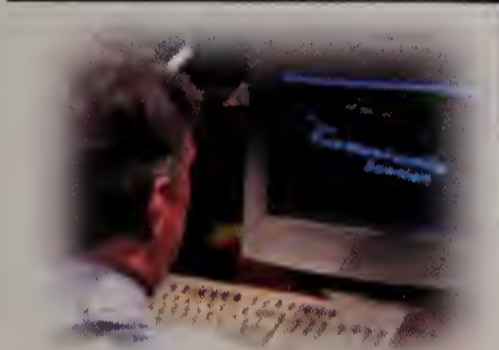


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BUSINESS

TOYS' E-SALES ADVANTAGE?

As the holiday buying season approaches, traditional retail toy stores are racing to catch up to electronic toy sellers, which already own the vast majority of mind share online. Even with that head start, though, online toy stores will pull in less than 1% of a market in the tens of billions of dollars. ▶ 38

POLITE SITES

Research conducted by Stanford professors Byron Reeves and Clifford Nass shows that people respond better to polite software. But can your Web site design be so rude that it's costing you business or eyeballs? You bet. They rate eBay, Amazon.com, ETrade and Yahoo to see what mistakes they may have made in building human interaction into a Web site. ▶ 40

MEASURING KNOWLEDGE

Knowledge management is notoriously hard to calculate. Top execs buy into the idea, but once projects start rolling out, they start looking for concrete measures of how worthwhile their systems are. A golden metric doesn't exist, but some managers of knowledge management systems have devised decent alternatives. ▶ 43

HIDDEN PERILS

Ed Yourdon is worried about the nonobvious year 2000 problems that will remain dormant

like malignant spores, springing to life long after Y2K vigilance has abated. Corruption of dusty data or interfaces are avoidable, but only if you're looking in the right places. ▶ 44

MONSTROUS IT

Life is exciting for the IT staff at Industrial Light & Magic, the creator of special effects for *Star Wars*, *Jurassic Park* and *The Mummy*. Deadlines are absolute, the technology is top-notch and employees love it because, well, it's show biz. ▶ 44

ACCOUNTING FOR SOFTWARE

A new software development accounting rule could mean more profits for companies that can write off some of their application development costs. But it could also be an administrative nightmare... or it could help enforce discipline on projects where none has been demonstrated before. ▶ 46

CONSULTANTS SURVIVING Y2K

Some consultants fear their Y2K work will leave them typecast and obsolete. Others are immersing themselves in e-commerce, enterprise resource planning and euro conversion techniques to make sure they're still marketable in 2000. ▶ 52

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CLICKING OFF THE CUSTOMER

HOT E-COMMERCE SITES attract consumers in droves, but many then drive them away by treating them like cattle. Analysts say many sites ignore the most basic courtesies expected in brick-and-mortar transactions, but sometimes the sites just don't have the business infrastructures to live up to customer expectations.

48

E-Retailers Have the Buzz, But Toy Stores Have Edge

Leading toy sellers struggle online, but Web market is still less than 1% of sales

BY LINDA ROSENCRANCE

IT'S BEGINNING to look a lot like an electronic Christmas for the online toy market.

This year, analysts predict that North Americans will spend \$230 million buying toys online — six times more than they spent last year. And 43% of those sales will be made at Internet-only sites like Santa Monica, Calif.-based eToys Inc., while only 28% will go to sites run by brick-and-mortar giants like Toys R Us Inc., according to a survey of 5,000 Web users by Greenfield Online Inc., a marketing research firm in Westport, Conn.

That's only 0.81% of the \$28 billion that Gomez Advisors Inc. projects Americans will spend on toys this year.

But the rapid growth of the Web as a toy channel has brick-and-mortar stores fighting for market share online, using their imposing physical presence as a weapon. That tactic can be effective, especially with toy buyers who are often far from leading edge.

"I'm relatively new to e-commerce, and I'm not quite sure about using my credit card to buy online," said Framingham, Mass., resident Linda Frank, 42. "It will take some neutral party, someone with a good understanding of the Internet, to convince me that it's safe to shop online."

On the other hand, 28-year-old Peter Panepento of Weston, Mass., said his wife is shopping for their 2-year-old daughter's main Christmas gift online, although she has impulse-bought smaller items while shopping in the real world.

"My wife thinks you can get

better deals online," Panepento said. "I'm all for it if it saves me from a trip to the mall."

That attitude is an advantage for electronic retailers, because they can educate consumers about toys and the affect they have on kids before a purchase, said Liz Leonard, senior analyst at Lincoln, Mass.-based Gomez Advisors.

Customer Support

But to take advantage of it, they have to create a customer-support experience rich enough to make up for the visceral experience of buying gifts in person, she said. Otherwise, they will avoid an electronic retailer as fast as they would a crowded mall.

the benefits of shopping with a company that combines clicks with bricks-and-mortar.

"Our online site adds another layer of choice for consumers," said Alan Marcus, a spokesman for New York-based F.A.O. "If a customer lives in Idaho and the closest store is 500 miles away, he can still shop with us [online]. Many of our products are exclusive to F.A.O., and we also cater to the die-hard collector, like those who collect Barbie. We're finding that [the Web site and the brick-and-mortar stores] are both helping each other," Marcus said.

In May, Consolidated Stores Corp. in Columbus, Ohio, which operates more than 1,300 KB Toys stores nationwide, joined forces with BrainPlay.com to launch online retail outlet KBkids.com in Denver.

"This is the best of both worlds — surf and turf," said Srikant Srinivasan, founder and CEO of KBkids.com. "Because of our combined resources, we can offer consumers additional customer care, including the ability to return toys [bought online] to any of our 1,328 stores."

KBkids.com is currently recognized as the most successful "clicks-and-mortar" player online, according to an Internet toy store scorecard issued by Gomez Advisors, in part because it manages to keep costs to customers lower than its competition does and also offers free shipping.

Toys R Us in Paramus, N.J., also launched an online site, but analysts including Leonard and Kurt Barnard, editors of *Barnard's Retail Trend Report*, said the site hasn't lived up to its hype and blame that on

the company's competitive position, but a recent company press release touted its customer-friendly Internet site, including an easy-to-use search engine that allows consumers to search by any combination of age, price, category, brand or keyword.

And Waltham, Mass.-based Toysmart.com just launched a \$21 million national advertising campaign to build awareness of its promise to sell only "good toys" — hard-to-find, high-quality toys that are educational, open-ended and fun,

unraveled, and Toys R Us lost out to The Walt Disney Co. in a bid to buy Toysmart.com. Later that month, CEO Robert Nakasone resigned, citing differences in direction for the company.

"There is not a high expectation for Toys R Us at this point," said Leonard, predicting it won't regain its No. 1 toy-seller status, which it lost to Wal-Mart Stores Inc. last year. However, the new CEO at ToysRUs.com doesn't share analysts' pessimism.

New CEO John Barbour predicted the company's brand will continue to pull in consumers. He cited a poll done by Harris Interactive Inc. in Rochester, N.Y., that contradicts the Greenfield Online survey, indicating that "64% of consumers would shop at ToysRUs.com vs. 43% for eToys."

ToysRUs.com is now unveiling a new ad campaign aimed at getting people to visit the site, Barbour said.

"There's no question that because of the previous changes in management at ToysRUs.com, we're late in kicking off some of our activities for the holiday season," he said. "But don't count us out." The company will use its brand image and by next year roll out new features, including the ability for customers to pick up purchases at local stores to save on delivery, he said.

Electronic Advantage

But upstart eToys.com is still the overall leader — online at least. "If convenience and price drive your shopping decisions, eToys is serving up your kind of fun," the Gomez report says.

Jonathan Cutler, an eToys spokesman, declined to com-

ment on the company's competitive position, but a recent company press release touted its customer-friendly Internet site, including an easy-to-use search engine that allows consumers to search by any combination of age, price, category, brand or keyword.

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ETOYS.COM'S easy-to-use search engine allows consumers to search by any combination of age, price, category, brand or keyword

That's not lost on big retailers, like F.A.O. Schwarz Inc. and KB Toys. They're beefing up their Internet toy-buying sites and advertising

the company's recent internal turmoil.

In August, a Web site development deal with venture capital company Benchmark Capi-

KBKIDS.COM manages to keep the costs to its customers lower than the competition and also offers free shipping

said Kelly McGovern, the company's chief marketing officer.

Even that may not convince many consumers who might consider e-commerce while trekking to the mall.

"We haven't done any online shopping for the girls yet, although we have bought computer software online," said Stephen Montgomery, 37, of Dedham, Mass., the father of three daughters. Still, "my wife said if we looked at any online toy site, it would be eToys because she's heard they're really good."

Rosenkrance is a freelance writer in Waltham, Mass.

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Net Manners Matter: How Top Sites Rank in Social Behavior

STANFORD RESEARCHERS Byron Reeves and Clifford Nass make the case that people dislike some Web sites — not because they are badly designed, but because the sites *behave* badly during their visit.

In their 1996 book *The Media Equation: How People Treat Computers, Television and New Media Like Real People and Places*, the two argue that humans don't react favorably to rude or unsupportive behavior regardless of whether the boor is real or virtual.

As officers at NetSage Corp. in San Francisco, the two put their research to work analyzing software interfaces and developing socially conscious help agents like the animated paper clip that gives usability pointers in Microsoft Corp.'s Office applications.

We asked them to analyze four leading Web sites — none of which is a NetSage client. Here are their views on which ones charm users into doing repeat business and which do more to put off potential customers than they do to lure them in.

— Kevin Fogarty

Personalization Features Set Amazon.com Apart

Casual tone promotes comfort and trust

Amazon.com Inc.
Seattle

Bottom Line: Successfully applies social rules to create a bookstore rather than a warehouse or a library.

Befitting its reputation as the premier e-commerce player, Amazon's book-buying site follows many social rules to great effect.

The consistent style and tone throughout the site communicates a reliable personality that builds comfort and trust in the business relationship. Appropriate for its products, the tone of the site is casual.

For example, Amazon tells users, "For now, you just need to..."

Visitors have a sense that the same person is communicating with them consistently throughout their visit at the site.

This promotes a feeling that customers have a single personal assistant rather than a

confusing group of merchants — all with different methods and personalities — to help with purchases. Amazon maximizes personalization with minimal information by offering suggestions based on previous purchases, discussing what people in geographic areas are buying and offering one-click shopping that uses information previously stored on the site.

It continually tells users where they are in the ordering and registration process, particularly when they're about to purchase something.

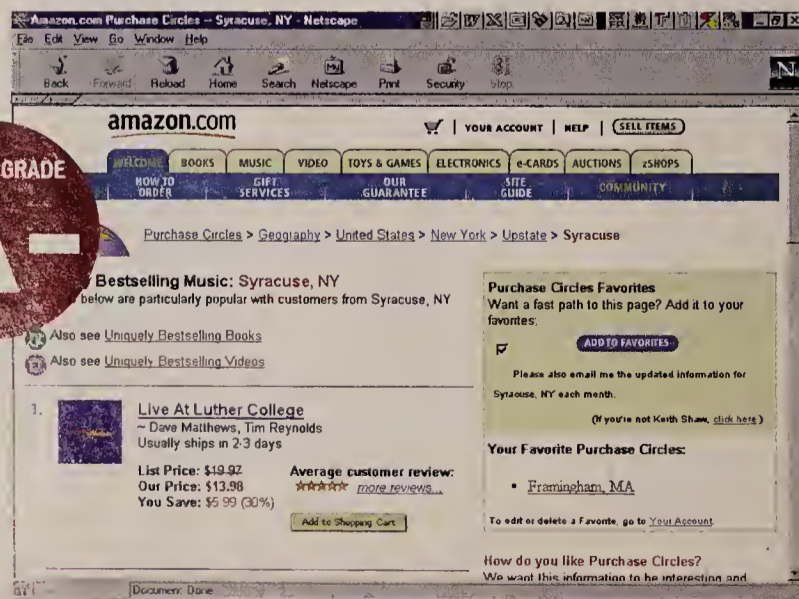
A confirmation to customers that they're "doing the right things" to

accomplish a transaction — commonplace in real-life transactions — is used effectively at Amazon.

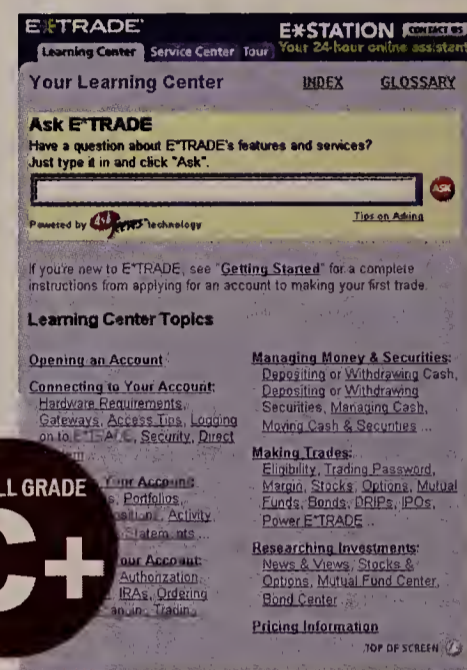
Amazon also effectively uses physical places on its site to let people know what to expect of the information presented in those places. For example, the largest column of information (the middle two-thirds of each page from the top to the bottom) is devoted to product information.

And regardless of whether a shopper is looking for books, music or electronic gear, the function of the space is unchanged. Even the details of price, shipping and discounts are identical among products.

Amazon-generated book reviews and postings from customers are mixed with book reviews (from, for example, *The New York Times*) to produce commentary relevant to many items. Through careful use of language calling for related groups or customers, (for example, *Purchase Circles* rather than, say, folksier *Neighbors*), and the avoidance of visual clutter around the buttons that execute the purchase, they remind the customer that this isn't a library.



AMAZON.COM'S Purchase Circles area maximizes personalization with minimal information



ALTHOUGH FULL OF INFORMATION, ETrade's help section can't take the place of a real-life stockbroker

ETrade Inviting, But It Lacks Interactivity

Needs to be more proactive when providing information

ETrade Group Inc.
Palo Alto, Calif.

Bottom Line: ETrade feels comfortable but follows rather than leads.

Stock-trading sites demand access to the most personal information we possess — how much we're worth.

For customers to be comfortable with this request, the site must constantly manifest trustworthiness and competence. Even though the tone of this site is casual (in contrast to the stereotypical image of a stockbroker), its language is internally consistent. This encourages trust.

Third-party information is very clearly delineated, both graphically and through text; thus, ETrade ensures that it's responsible only for the information it controls and distances itself from more speculative or potentially low-quality information. Treating people as special because of

individual attributes suggests intelligence and responsibility. There's good personalization for heavy-traders at ETrade.

Because the most valuable customers receive special service, they are flattered, and everyone is a sucker for flattery. Unfortunately, occasional customers are marked as second-class citizens. That problem could be ameliorated by encouraging customers to move to the *most valuable* status by providing intermittent rewards, especially when those rewards are given out of "kindness."

Research shows that when a site helps users, they will feel a subconscious obligation to reward the site — in this case, by trading more actively. A deficiency on this site is the lack of proactive interaction.

In information-intensive activities like stock trading, it's extraordinarily worthwhile to have information presented to the customer "just-in-time." But information provided on ETrade is 100% demand-driven, meaning the customer must know what to ask for.

A help system that answers any question a user is clever enough to ask can't take the place of a stockbroker working as a teammate in what for many is a scary and lonely process.

Live financial assistants tell people what is about to be done, when the transaction is complete and, most important, that they did all the right things to make the transaction a successful one.

Complexity, Clutter Make Trip to Yahoo Frustrating

Information overload annoying to some

Yahoo Inc.
Santa Clara, Calif.
Bottom Line: A very disconcerting place.

Our natural social reaction when entering complex situations is to search for clues about how to behave. No one wants to look foolish.

Yahoo can frustrate people entering its site because pages are so cluttered with information that users must constantly wonder, "What's most important here? What should I do next?"

The Yahoo site seems to say, "I'll do anything you want if you can figure out how to ask."

That may work for users who know exactly what to do, but if they don't, the passive stance feels more like a passive-aggressive one.

Most users want some notion of what to do — less is often more. Because people think of Web sites as places, it's useful for people to keep track of when

they move from place to place.

Yahoo often frustrates users attempting to do this by automatically moving people from its site to someplace else. A tour guide who says, "Here's a great place," and then walks away without explanation would be in trouble with the tourists.

This practice also dilutes the Yahoo brand because there is no way

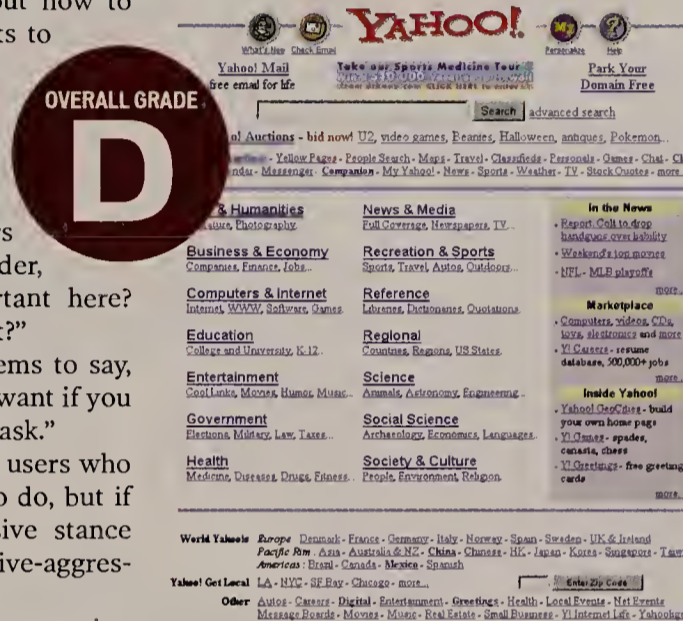
to distinguish links within the Yahoo site from those that will take people elsewhere.

When users have to spend time thinking about what to do, they pay less attention to the content on the site — including the advertising.

The distractions of complexity are not only annoying; they also undermine the basic business model of a portal site (attentive eyeballs). When people divulge a lot but are greeted anonymously, it can make an impersonal and even impolite impression.

Although Yahoo gathers substantial information about user preferences and interests, there are few signs that this information is used to personalize information. Yahoo manifests knowledge of its users only in the most obvious ways (for example, fulfilling requests for particular news items). While large-scale personalization might be technically difficult, it has enormous social benefit.

Cleverly distributed and subtle adaptations to users, such as age-specific or gender-specific language, can create a feeling among users that they have been there before and are welcomed and familiar friends.



YAHOO'S SITE is heavy on information and light on guidance, which can distance users who aren't sure how to progress or what is most important to them

Hands-off Approach Reduces eBay's Expertise, Authority

Delays, lack of guidance, hurt online auctioneer

eBay Inc.
San Jose
Bottom Line: An expert auctioneer that doesn't behave like one.

People labeled as experts, whether by others or themselves, are perceived as more competent, more trusting and more likely to provide unique knowledge and expertise. But eBay's reputation as an expert suffers because it doesn't correct sellers' mistakes and is considered to be complicit in these errors. For example, typographical errors in product descriptions reduce credibility, yet eBay doesn't edit that text.

There are trade-offs among image size, picture quality and details of the background in product presentations, but eBay doesn't make suggestions or offer ways to improve them.

A lesson here is that people hopelessly confuse the errors of the "message" with the competence of the "messenger"; poor presentation undermines eBay as well as the sale items.

eBay is also impolite. For example, signing up for an account can take as long as 24 hours for confirmation. eBay users also aren't alerted when they omit a field during registration.

Instead of dismissing people during that period, eBay should invite customers to browse. A good social partner tries to own the problems and makes an attempt at resolution.

eBay also fails to carry through on the notion of a "personal" shopper.

It's unclear how to submit the initial form that activates

the personal shopper, and the shopper doesn't save a list of items on which the customer might want to bid. Having someone remember things for you is key in personalization.

Finally, eBay users must traverse many pages to find the personal shopper — the exact opposite of what a "personal" shopper should be. The idea of an automatic bidder, someone working on your behalf, is a social plus.

However, eBay should place more attention and emphasis on making the bidding process personal rather than simply automatic. ■

OVERALL GRADE D

Status	Item	Price	Bids	Ends PDT
Current	MOUSE PAD THAT HELPS WITH MATH! NO RES. DUTCH	\$8.99	-	10/21 11:58
Current	LOOKS LIKE A SWISS w/ stainless steel blade	\$6.75	-	10/21 11:34
Current	MULTI-PURPOSE PLIERS less than \$10 w/ shipping	\$6.75	-	10/21 11:15
Current	TATTOO JEWELRY/4 NECKLACE 4 BRACELET 4 RINGS	\$1.99	-	10/21 11:09
Current	NEW "THE DAY YOU WERE BORN CD - This Is COOL!"	\$5.95	-	10/21 10:58
Current	EXT RARE 1955 ROBERTO CLEMENTE RC	\$100.00	-	10/18 10:58
Current	RED HOT -> NEED TO LOSE OVER 20 POUNDS FAST??	\$26.95	-	10/21 10:53
Current	NAVAJO RUG "Teec Nos Pos" PRICED LOW 73" MINT	\$400.00	-	10/16 10:44
Current	SOFTEST LEATHER PASSPORT WALLET! MSRP \$4.95!!	\$5.88	-	10/21 10:41
Current	Beautiful Spain-Glass Dolphin Carousel *DUTCH	\$9.99	-	10/21 10:21
Current	Spain Glass Unicorn Carousel Great Gift *DUTCH	\$9.99	-	10/21 10:15
Current	3 CENTS PER MINUTE PHONE CARD DUTCH MUST SEE	\$10.00	-	10/21 09:55

POOR PRESENTATIONS by sellers and a 24-hour delay before receiving confirmation to use the site can make eBay feel impolite

Reeves is a professor of communication at Stanford University and a specialist in the psychological processing of media in the areas of emotions, attention, learning and physiological responses.

Nass is an associate professor in communication at Stanford, specializing in the social and psychological effects of human-computer interaction.

Both are also senior vice presidents for interface research at NetSage.

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Finding Ways to Gauge Knowledge

Pressure from the top leads to ROI tracking

BY DOMINIQUE DECKMYN

RETURN ON investment (ROI) has been notoriously difficult to prove for knowledge management projects. But under pressure from management to deliver tangible results, some companies are finding ways to measure the impact of their knowledge management initiatives.

"When you discuss the benefits of sharing knowledge on a conceptual level, it's very easy [for management] to buy in to it," said Jeff Jackson, an engineering consultant at Houston-based Shell EP International Ventures Inc. Jackson headed a knowledge management pilot project in which experts in deepwater oil exploration were grouped into a "community of practice."

"[But] when you get into the actual work of [knowledge management], management starts to rank it up against other [investments]" and ask more pointed questions about payback, he said.

To prove the success of three knowledge management pilot projects at Shell, project leaders conducted interviews with participants, then presented the results at a conference for top executives.

Those three projects recently won funding for the creation of additional communities of practice at Shell next year. Jackson said "serious anecdotal measures" are the best way to gauge a knowledge management project's success. But some people are aiming for more tangible metrics.

San Francisco-based electronic-business consultancy Scient Corp. has developed an infrastructure where consultants share ideas that is based on Microsoft Corp.'s Internet Information Server Web server. Suan Tong Foo, director of knowledge management at Scient, said the impact of such a project on productivity can be measured quite easily using several metrics. Some are pretty basic, but Scient wants to come up with more sophisticated ones. For instance, it hopes to prove that its project has halved the time it takes for a new employee to get up to speed.

"You need to define a success metric," said Tom Koulopoulos, president of Boston-based research firm The Delphi Group Inc. But only 14% of U.S. corporations that invest in knowledge management are using such metrics to measure ROI, he said.

The need for that elusive hard ROI data shouldn't be overemphasized, Koulopoulos noted. "No one has ROI for their e-mail system; everyone just accepts they need it." ▀

Telecommuting Continues to Rise

BY JULEKHA DASH

Given the ubiquity of PCs, workers' increasing demand for flexible hours and the headaches of wading through traffic, it's not surprising that recent studies reveal a growing number of employees telecommute at least part time. One study, conducted by InfoBeads, the market research arm of Ziff-Davis Corp. in San Francisco, tracked telecommuters who use PCs and found that the number grew 30% in the past year to almost 7 million.

Many firms find that telecommuting programs are key to luring high-level executives, including information technology employees. Thirty-five percent of 1,400 CIOs said they let their IT staff telecommute, according to a study by RHI Consulting Inc., an IT personnel placement service in Menlo Park, Calif.

In various professional categories, the percentage of telecommuting executive and managerial-level workers

grew the fastest, with a 45% increase, said InfoBeads.

Jack Nilles, a consultant at JALA International Inc., a Los Angeles consulting firm, said attracting and retaining workers is the No. 1 reason his clients allow telecommuting.

Among Nilles' clients, turnover for telecommuters is 50% to 80% lower than for nontelecommuters, he said.

Dave Tremblay, InfoBeads' senior industry analyst, said that in the tight labor market, employers will continue to offer flexible schedules.

But having good IT support for telecommuters also counts, according to Ed Burgess, CIO at California's Department of Personnel Administration. Burgess said he knows of one co-worker, an attorney, who, after having been transferred to another state office, returned to Sacramento when his employer didn't support his telecommuting with remote network access. ▀

LEARNING

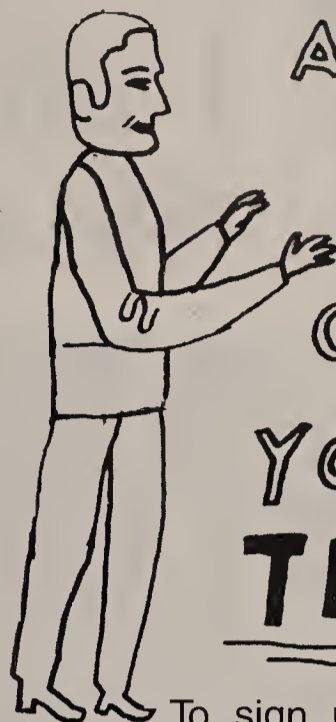
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WORKSTYLES

What It's Like to Work at . . . ILM

Interviewee: Andy Hendrickson, director of systems development

Company: Industrial Light & Magic (ILM), the visual effects studio that helped create *Star Wars: Episode I*, *The Mummy*, *Saving Private Ryan*, *Men in Black*, *Jurassic Park* and *Twister*, among others; a division of Lucasfilm Ltd.

Main location: San Rafael, Calif. (20 minutes north of the Golden Gate Bridge, in Marin County)

Number of IT employees: Just over 45

Number of employees (end users): 1,000

Dress code: "You can't come to work naked — how's that? Even shoes are optional. I'm dressy today, in jeans and a button-down shirt."

What are the projects like? "We support the people designing the special effects. We're a 24/7 facility; photorealistic computation is going on night and day here — rendering, compositioning. Making the visuals we see on the movie screen takes hours and hours of computation. We're a very large site, and we have a number of super-computers here — Silicon Graphics Inc. Origin 2000s — that we keep busy chewing away on these problems."

Anytime any of these systems fail, we might not get an image out the next day, and we have severe drop-dead dates for deadlines. Slipping any of those would be disastrous. When you see a trailer in the movie theater, the movie is still not done. And [the trailers] are telling viewers when the movie will open, and we have to have it out the door on that date."

What's the IT mission? "The systems development mission is to provide next-generation computing facilities on which

the images can be made. That includes evaluating and building new clusters of supercomputers, evaluating and modifying new types of file systems in which to hold these images and designing and constructing business logic solutions for motion picture image generation.

Workday: "About 9 a.m. to 6 p.m. There's overtime at times, if we're in a crush period to get a show out the door."

Decor: "Wild. We

have some deep purple walls, red walls, yellow walls. And the offices are decorated with models from past films, like R2-D2 prototypes, Imhotep statues from *The Mummy*, dinosaurs from *Jurassic Park* — not the big ones, the little reference models."

What do you see in people's work areas? "Models and figurines from the movies. Toys, inflatable Godzillas, posters from old films."

Little perks: Free weekend screenings of new movies; impromptu catered parties on Friday afternoons; wrap parties; an annual Halloween party. "You can imagine the costumes people put together. They're spectacular, and the company gives great prizes like a trip to Hawaii or an SGI workstation to take home. The costumes are always a big secret until the party."

Does the IT staff ever get screen credit? "Some of us get our names on the screen — I've had mine listed many times, and it's always a thrill."

Does that make IT folks eligible for Oscars? Yes.

Would employees feel comfortable e-mailing company President Jim Morris? "Sure — they do it all the time."

What about George Lucas? "Yes, if I had something I wanted to speak with him about."

— Leslie Goff



Industrial Light & Magic, a Division of Lucas Digital Ltd.



ILM helped create the movie *The Mummy*

ED YOURDON

Data corruption: the silent Y2K killer

WHenever we think about Y2K failures, we tend to focus on the "visible" problems — for example, the embedded systems failure that causes a refinery to explode is "fix on failure." Meanwhile, there's another Y2K failure that's far more insidious, one that will require attention and resources throughout

next year: the data corruption problem.

I'm not talking about data corruption that's massive, sudden and visible — such as a payroll system that runs amok and sets every employee's salary to zero. What I worry about is the Y2K bug that corrupts only a tiny percentage of a database, in such a way that its impact is not immediately visible. For example, what if a bug updates an active database record correctly but also clobbers a small portion of a dormant database record — such as a code rewrite that correctly replaces a two-digit YY "year" field in an active database record with a four-digit YYYY field but contains a bug that clobbers the first two bytes of an adjacent record? It may be months, or even years, before that dormant database record is accessed or until enough dormant records have been clobbered that the entire database collapses. And the problem can be more subtle still if the bug involves interfaces between systems operated by separate organizations.

Data corruption isn't a new concept, and it's not unique to Y2K. But, ironically, some organizations learned about long-term data corruption problems in their databases only as they began working on their Y2K remediation efforts.

So, how do we cope with data corruption? Most organizations believe they can avoid the problem through rigorous testing and through whatever error-checking mechanisms are built into the application code and the vendor's DBMS package. But they may be fooling themselves; the odds of avoiding corruption in a database with 10 million records that has been running for 10 years are small. Indeed, it's likely that the only reason organizations do have stable systems is that they build them one at a time and modify them relatively slowly over time.

Y2K is fundamentally different because it involves making massive changes to all the

systems all at the same time. Yes, the testing effort has been extensive in most large organizations, and we'll probably eliminate most, if not all, of the visible bugs. But it requires enormous optimism to assume that we will have eliminated the subtle bugs that cause the insidious data corruption problems — especially when independent verification and validation vendors such as Cap Gemini, MatriDigm and Reasoning Systems report finding between 400 and 900 bugs per million lines of code that were supposedly remediated and supposedly tested. I believe it's more realistic to assume

that the data corruption problems will occur and that we might not see them for months or years after Jan. 1.

So the question remains: How do we cope with data corruption? The solution is simple and obvious — though by no means foolproof. We need to develop extensive data auditing, data verification and data integrity programs and then use them periodically throughout 2000 and possibly beyond. Depending on the size of the database and the amount of spare CPU cycles available, we should run these programs daily or at least weekly for the first few months. Depending on the outcome, we may be able to relax our vigil later and run the programs monthly.

There are commercially available data verification packages, and some organizations have developed their own programs to minimize data corruption. But it's not a common practice, and most of the organizations I visit haven't planned on spending money or computer resources on this kind of strategy next year. I believe this will be an expensive over-

sight and one that will exacerbate the Y2K problem far beyond what it should have been. ▀

I worry about the Y2K bug that corrupts only a tiny percentage of a database.



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A new accounting procedure may force IT project managers to shape up at the risk of finding their applications development functions shipped out
By Kathleen Melymuka

BOOKKEEPING did in Al Capone, and it could do the same to your applications development organization. A new accounting standard is forcing information technology project management to shape up or draw the wrath of the Securities and Exchange Commission (SEC). Specifically, the standard requires detailed time and task records for software development projects — exactly the kinds of records many project teams couldn't put together if their lives depended on it.

But their jobs might.

"If management feels the internal development organization is out of compliance with Generally Accepted Ac-

counting Principles, that will be another increased driver to outsourcing development," says Matt Light, a senior analyst at Gartner Group Inc. in Stamford, Conn. "A successful [applications development] organization will have to get better at complying or face losing their jobs."

The matter in question is SOP 98-1, "Accounting for the Costs of Computer Software Developed or Obtained for Internal Use," a statement of position or Generally Accepted Accounting Principles (GAAP) written by the American Institute of Certified Public Accountants (AICPA) at the SEC's request.

It applies to virtually all companies that buy or develop software for internal use.

"Any public company that reports to the SEC has to do its accounting under GAAP," says Dan Noll, technical manager of accounting standards at the AICPA in New York and technical man-

ager for SOP 98-1. "And even if you're not a public company, if you ever want to borrow money, you have to apply GAAP."

SOP 98-1 impacts the way companies publicly report profits and losses. It took effect for fiscal years beginning after last Dec. 15, and there's no question that to fully comply, companies should adopt it by the end of this year. But Kurt Potter, a senior analyst at Gartner, reports that some of his clients seem to think there's wiggle room. "A lot of people are sort of dragging their feet because they're having to adjust their procedures to the new reality," he says.

In a research note on the subject, Light opines that "most public auditors will likely allow two to three years before they begin to add 'qualifiers' to financial statements that do not adhere."

But Noll says he disagrees vehemently. "That's flat-out wrong," he says. "You're not going to hear a CPA say that. A company must start implementing this as of Jan. 1, 1999."

Why Now?

Until now, there's been no standard rule to account for software costs on profit-and-loss statements. Gartner estimates that 60% of companies wrote off software purchase and development costs as expenses in the current fiscal year, while 40% treated software packages as assets, depreciating their purchase and development costs over several years as they would hardware. As a result, companies with similar profits and losses could look quite different on paper (see chart, page 47), defeating the purpose of financial statements. "A financial statement is supposed to enable investors to compare apples to apples," says Light, "but there was a wide variation in practice for accounting for internally developed software."

SOP 98-1 requires that off-the-shelf software be treated as an asset and capitalized over its useful life.

Internally developed software is trickier. The AICPA has identified



WEBB CHAPPELL

COMPLYING WITH THE RULE is "a considerable amount of work," says New England Business Services' Sharon Carbone

Hold- ing IT A

three stages of development and instructed companies what to do about expenses in each stage. In a nutshell, planning costs must be expensed, development must be capitalized and implementation and operation must be expensed.

Although there's no such thing as a "typical" company, Potter estimates that for a large North American corporation, more than a quarter of the IT

project management, the rule is a challenge. New England Business Service Inc. (NEBS) in Groton, Mass., has a sophisticated project management culture, complete with a project office. "We've been tracking time, and we've always had project plans and tasks," says Sharon Carbone, project management consultant at the project office. Even so, complying with the rule is "an incredible amount of work."

no clue," Carbone says. "I have to go back and ask, 'What exactly is this particular task?' It takes a lot of work."

That's because the reality of project management doesn't always fit neatly into the rule's categories. For example, NEBS has been acquiring companies and integrating them into its systems. "We can capitalize that because we're providing new functionality for them — that's a new project," Carbone says. "But when we're converting their data over, we can't capitalize that. Any of the programs we write to convert the data can be capitalized, but we can't capitalize the actual work to convert the data. Then you can't capitalize any post-implementation or training."

Or what if someone is adding new functions to an existing program and doing modifications at the same time, and it's all in one project plan? "When you do development on the modifications [that can't be capitalized], that has to be called out as a separate task from development on new functions [that can]," she says.

Carbone is training project managers on these subtleties, and she's using the Results Management Suite from ABT Corp. in New York, which provides task flags that, theoretically, can automate the SOP reporting process. But until she's confident that the project managers understand the SOP well enough to assign the proper flags to each task, she'll continue the monthly review.

Although the SOP has been challenging for Carbone, it has underscored the usefulness of the larger project management structure at NEBS. Companies lacking that structure will find that the SOP underscores their shortcomings, and that could prove fatal in a world increasingly drawn to outsourcing. The SOP "will strengthen [application development] organizations that have strong processes and render weak AD groups less tolerable to their managements," says Light. "SOP 98-1 will light a fire under organizations that cannot meet its challenges." ▀

Two Approaches

Before SOP 98-1, companies with identical revenues and expenses could look different on paper, depending on whether they capitalized or expensed software development costs. SOP 98-1 allows for less variation.

	COMPANY A	COMPANY B
ANNUAL REVENUE	\$500 million	\$500 million
LESS NONSOFTWARE EXPENSES	-\$450 million	-\$450 million
Profits before software expenses	\$50 million	\$50 million
BEFORE SOP 98-1		
Less \$15 million in software expenses	-\$15 million	-\$3 million*
REPORTED PROFIT	\$35 million	\$47 million
AFTER SOP 98-1		
Less \$15 million in software expenses: \$3 million expensed \$12 million capitalized over five years by Company A, three years by Company B	-\$5.4 million	-\$7 million
REPORTED PROFIT	\$44.6 million	\$43 million

*\$15 million capitalized over five years
Note: All figures are arbitrary and chosen for illustrative purposes only

budget may be subject to SOP 98-1. "If the new accounting is different from what they were doing before, it's going to have an impact on the bottom line," says Noll.

Even more immediate is the impact on IT. For companies with immature or nonexistent project management disciplines, making the distinctions required by the SOP will be a huge task. "I think this will force companies to do their accounting right and keep track on a very detailed level," says Noll.

But even for companies with strong

In an attempt to assure that each project would follow a standard reporting procedure, Carbone summarized the 39-page SOP document for project managers. But that wasn't enough. "When we first attempted to do this, everyone had a different interpretation" of her interpretation, she recalls.

So for now, the project office spends about four staff days a month reviewing projects down to the level of individual tasks to be sure project managers are reporting correctly. "Sometimes when a project manager names a task you have

It Gets Easier Over Time

For companies that were doing some form of software capitalization before SOP 98-1, compliance will be less trying.

Textron Financial Corp. in Providence, R.I., for example, began capitalizing software costs in 1996, and because it already has sophisticated project management and accounting in place, all the SOP required was a little tweaking of existing systems.

"We capture labor down to the task level and the quarter-hour level," says Dave Raspallo, senior vice president and CIO. "I get weekly reports, and we feed our monthly labor reports right into the general ledger."

Raspallo and the chief financial officer have worked together on the SOP just as they have on their previous accounting positions. "If we can't agree — which is seldom, if ever — we take the more conservative position," he explains.

Under the new rule, Textron is able to capitalize about \$2 million of its \$9 million IT budget. Raspallo's project management software produces an 80-page report each month detailing every IT cost, with each capitalizable project flagged and each project task identified. "It takes discipline, and it requires some judgment on my part, but there's a fair amount of automation, and since we've been doing this for a number of years, it's about an hour's worth of work. Once you get in the swing of this, it's pretty easy."

Raspallo says smooth project bookkeeping requires a good working relationship with your accounting and financial departments. "Your audit team will come in and want to see the records," he explains. "They see that we have a practice, a process, an approach — that we are tech people actually doing good accounting. They feel comfortable with the numbers."

It's also important for the IT team to understand the importance of keeping good records. "This is not an issue of Big Brother accumulating numbers," he says. "We can benefit the bottom line by tracking our daily effort, and we can have a more gradual hit to the company's [profit and loss]. It's an advantage the government gives you, so why not take it?" — Kathleen Melymuka

To obtain a copy of SOP 98-1, contact the AICPA at (800) 862-4272

accountable

How to Click Off The Customer

E-commerce may be convenient, but technological snafus and poor processes are turning away business
By Erik Sherman



THOMAS BUCKLEY has a passion for Tiffany glass. But in taking to the Internet to add to his collection, he has discovered that not all objects — or Web sites — are always what they seem.

Buckley frequently finds himself on auction site eBay Inc. in his quest for more Tiffany. But he has often found that items advertised as Tiffany simply aren't. He understands the risks and has everything authenticated. Pieces that don't make the grade go back to the seller.

But he's less understanding about re-

ceiving "warning" e-mails from eBay. Several times, after returning a disappointing piece, Buckley has received a harshly worded message that said if he continued to cancel transactions, eBay would close his account. Buckley didn't answer — he couldn't. The e-mail explicitly noted that he couldn't reply to it, and e-Bay doesn't post its phone number.

"They don't care," says Buckley, CEO of a direct marketing company in New Jersey. "If they didn't get paid the listing fee, they get aggravated. There's probably an appeals system somewhere; I just don't know where it is."

According to eBay spokesman Kevin

Pursglove, who says he had never heard of the particular warning message that had been sent to Buckley, the company had noted general problems with its form e-mail letters and started revising them earlier this year.

"We wanted to put a friendlier tone on them, and we wanted to reduce the dependency on auto-response letters," Pursglove said.

The company isn't the first to suddenly realize that it has stumbled upon weaknesses in the implementation of its online strategy. According to Shelley Taylor, owner of market research firm Shelley Taylor & Associates in Palo Alto, Calif., weaknesses in service, product information or basic business procedures catch many e-commerce ventures — both large and small — by surprise.

"The most basic translations of brick-and-mortar wisdom into e-commerce have been missed," says Taylor, who recently presided over a study of 50 online stores.

It's easy to forget that in between the sticky Web strands that catch customers are open spaces that people often pass right through. In Buckley's case, eBay relied too heavily on technology and fumbled on the human touch. In other cases, a business would be better off with more automation and a less-personal touch.

Lacking Integration

Ask Tom H. Wilson Jr. about the need for robust connections between a Web site and a company's back-office systems. He's not only vice president of the Internet application solutions division at Charlotte, N.C., systems integrator Osprey Systems Inc., but he's also a disappointed e-commerce customer.

After receiving a flier from GH Sports, a tiny sports store and e-commerce business in San Luis Obispo, Calif., Wilson placed a \$75 order for three close-out specials.

He thought he was set. But the next day, his wife got a call from the company. He wasn't set.

"One product was sold out, one was

on back-order and the third was available," Wilson says.

It seems that GH Sports tracks its inventory on a Microsoft Corp. Excel spreadsheet and updates inventory levels on the Web only twice per week, according to Lara Blanchard, GH Sports' director of operations.

"It's not a system that works in real time with the inventory on our Web site," says Blanchard. "That is a change we want to implement very soon. I'm embarrassed that the customer had that problem."

Someone might expect integration problems with a firm that has five employees, tops. But the expectations bar rises when the company is large and publicly held.

Wilson remembers another order he placed, this time on the 800-Flowers.com Web site. All he wanted to do was send someone the spring tulip arrangement prominently promoted on the company's Web site.

The company uses a network of florists around the country that actually provide the flowers. But those shops don't have to provide their inventory information to 800-Flowers.com, the company says. That explains why Wilson received a phone call a few hours after placing his order, explaining that the florist was out of tulips and asking if 800-Flowers.com could try another florist. It finally found someone in the area who could deliver, but by the time 800-Flowers.com placed the order, it had missed the delivery deadline. The flowers arrived a day late.

Company spokesman Ken Young blames such a problem on the lack of inventory data from the approximately 1,800 florists who work with 800-Flowers.com. Therefore, Young says, almost a third of deliveries must be passed onto other florists outside 800-Flowers.com's network, many of which work on paper, not computers, and so can't make their inventory available to the Web site.

"You're greatly increasing the chance that you're getting a non-technology-savvy person," says Young. Unfortunately, customers don't want to know that. They have expectations of what business is like on the Web, and a company must plan accordingly. Even a pop-up note saying that accurate inventory information wasn't available for that destination might have disarmed disappointment.

In a way, the cause doesn't matter. As Wilson says, "If your Internet store cannot offer [an adequate] level of customer service, people will come to your site, be disappointed and not come back." In other words, pretending won't make a problem go away. ▀

Sherman is a freelance writer in Marshfield, Mass. Contact him at esherman@reporters.net.

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POST-

Y2K

DISORDER

Some year 2000 consultants say the experience has left them feeling dirty. Others say obsolete. The aggressive ones are scrambling to gain new skills for the next big opportunities
By Leslie Goff

BRENDA SHELTON IS NO GANGSTER, but she can relate to Michael Corleone in *The Godfather*: Just when she thinks she's out, they pull her back in. Each time the AS/400 consultant has walked away from a year 2000 conversion project, she has ended up on another one, even when her contract was for a different job.

"Most of my clients didn't hire me for Y2K, but then they would put me on the team because of my speed," explains Shelton, who launched her practice, Essential Consulting Inc. in Seaman, Ohio, in October 1997. For example, her current client, General Revenue Corp., moved her onto its Y2K project after the custom package she was hired to install didn't ship on time.

Shelton's determined, however, to make this Y2K job her last. Even though she anticipates that demand for Y2K assistance will continue at least through March, she wants to start her transition well before the ball drops on New Year's Eve.

"I'm afraid there may be some stigma related to Y2K," Shelton says. "I think that other technical peo-

ple, plus the people who hire consultants, look down on it because it doesn't take an Einstein. It's pretty repetitious, it's not well respected and you can lose your technical edge if you do it for very long."

Shelton's concerns about her future viability aren't unique. As summer was winding down, consultants who have been reaping the fruits of the millennium bug problem were turning their attention to the post-boom transition. And while year 2000 contract work stays steady and rates climb higher as Dec. 31 approaches, apprehension about being typecast is beginning to surface as Y2K projects move into the final test phases.

Most independent consultants expect demand to continue into early next year, especially with fears about potential glitches related to the leap year date change. Nonetheless, forward-thinking consultants plan to get off the Y2K train before the end of the line. They're predicting which information technology projects that have been on the back burner during the Y2K blitz will now move to the top of the priority list.

Emerging front-runners are the three Es: e-commerce, enterprise resource planning and the euro conversion, consultants say. But the realities of consulting are that many haven't had the time to immerse themselves in new technology training. Instead, they're looking for on-the-job opportunities to move into new skills areas, mulling ways to leverage their Y2K experience for future gain without having major bench time in between.

One way to do that and gain a toehold in the three Es is to transfer Y2K quality assurance and testing skills to a new project, says Mike Gilfillan, founder and CEO of Atlanta-based ComputerJobs.com Inc., a career site for IT professionals. Consumer and business-to-business Web sites, for example, require a tremendous amount of testing.

"Customer service is the No. 1 priority at those sites; you have to be sure all the features work," Gilfillan explains. "So you have to check and test the code with all the different iterations of browsers and modem speeds and make sure the application can withstand traffic and usage. If you can test an application to see if it's Y2K-compliant, then you have the overall mind-set for making anything else work."

Highlighting your business skills, industry back-

ground or other credentials is another effective way to land challenging assignments after Y2K wraps up. Play up anything that shows you have got more stuff than just a millennium-bug fastball.

Shelton, for example, was an IT manager at a manufacturing company before she started consulting. She says she seems to gain the confidence of her IT managers quickly because she can relate to their priorities. And that makes for good repeat business that will open up roads to new projects and new skill sets.

One of her previous clients, for example, is waiting for an agency noncompete clause to expire so she can return to work on an AS/400-based Lotus Notes project. The client already allowed Shelton to sit in on an on-site Notes administration course and has invited her back for a development class. Learning both Notes and Domino, she says, would make an ideal passage from year 2000 work to a growth area and from shrink-wrapped application implementations to more strategic development work.

Protecting Valuable Skills

Even consultants who have already delved into new technologies are preoccupied with thwarting any negative perceptions about Y2K specialists that might be lingering in the marketplace.

Naveen Aggarwal, owner of Business Technical Solutions Inc. in Chicago, derives approximately 15% of his business from non-Y2K projects, such as overseeing C and C++ applications development. Moreover, his year 2000 jobs have involved management consulting and quality assurance and testing of applications converted to Microsoft BackOffice and other client/server environments. Nevertheless, Aggarwal says his Y2K experience has the potential for backfiring on him by lessening his perceived value in the open market.

"I am not worried about transitioning to new jobs," he says, "but, by focusing on Y2K, did I lose anything that might have made me more valuable today? I have a friend with the same bachelor's degree and roughly the same skills, but he has been a salaried employee as an Oracle [database administrator]. I've made triple the money that he has, but his experience is probably more valuable because Oracle is so popular and peo-

ple look at it as the future. So if you compare us in terms of demand, his experience is probably worth more."

Aggarwal is looking to increase his value by promoting his business skills and experience to go after the next big problem — the euro conversion. He will emphasize his year 2000 quality assurance and management consulting experience coupled with his client/server development skills. Each quarter, he takes at least one evening class at the University of Chicago to strengthen his business credentials.

"The euro conversion will affect everything — from something as simple as a vending machine to the banks and financial systems," Aggarwal says. "They'll need people with good Y2K backgrounds who are multilingual and have strong business backgrounds along with technical skills. I think we'll be able to charge even more money for those projects than Y2K."

Pure Cobol Y2K programmers will have a harder time overcoming market perceptions, Gilfillan says, but the business-focus strategy can still work for those who can combine it with at least one updated technical skill.

Donna Carlson, a Cobol programmer and Y2K contractor for Entelligence Inc., an agency in Houston, has been consulting off and on since the mid-1970s. She left the IT profession for a while in the mid-1980s to pursue a fine arts degree, but the lucrative Y2K opportunities brought her back into the mainframe world. Now she's eyeing a Visual Basic class as a first step into the client/server world. Ultimately, she would like to combine her programming skills and interest in art and design to target e-commerce.

"I think [Visual Basic] will give me a pretty well-rounded picture of the way things function in a client/server environment," Carlson says. "It will be a good building block because it seems to be the meat of how things are processed."

Mastering Visual Basic would also be a stepping stone to other new programming languages and tools like Java, Common Object Request Broker Architecture and SQL, Carlson adds. But she expects that her applications experience rather than her specific technical skills will carry her over.

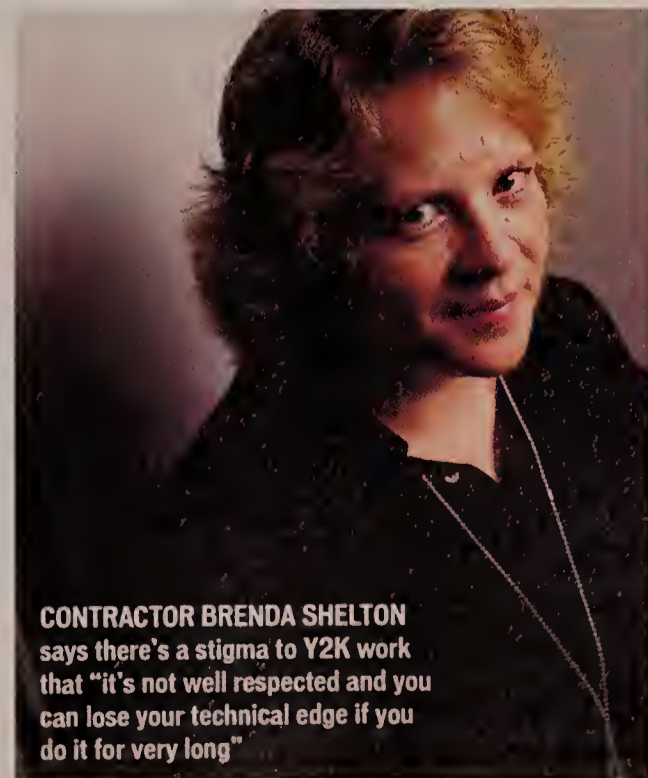
Like Carlson, Bill Riley has been immersed in a world that is starting to look obsolete. Riley has 39 years of systems software experience, primarily in the Honeywell mainframe environment. He has had plenty of work to keep him occupied making Honeywell applications Y2K compliant, and he expects the cleanup work will last another two years or more. But, he says, it's dull: "It's simple-minded — you find the dates and you change them. There's not much challenge."

Riley has already begun to cut back on his schedule, but he's not ready to retire just yet. One promising opportunity for staving off retirement but maintaining a flexible schedule lies in the aftermath of Y2K. Riley is positioning himself, with a group of colleagues, to be an expert witness in the potential lawsuits that could result from the millennium bug. His exposure to a wide range of industries coupled with his niche technical expertise make him the kind of witness that would be useful to either the plaintiff or the defense.

"It would involve evaluating the actions that a company took and whether it did the right thing in addressing the Y2K problem," Riley explains. "It would be great incremental income over many years. The rate for being a witness will be at least as much as the consulting rate, and quite likely it could be at a premium." ▀

Goff is a frequent contributor to Computerworld. Contact her at lgoff@ix.netcom.com.

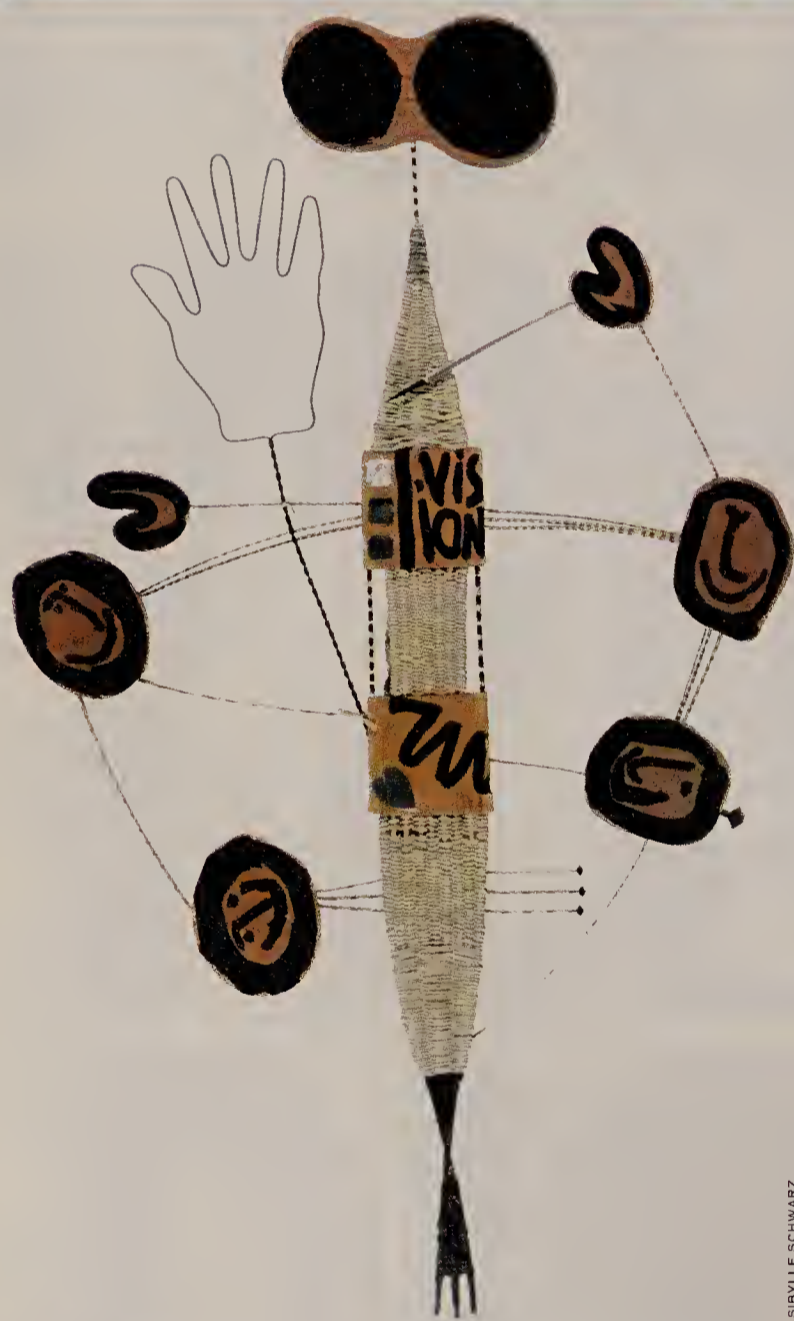
ERS



CONTRACTOR BRENDA SHELTON says there's a stigma to Y2K work that "it's not well respected and you can lose your technical edge if you do it for very long"

Photo: G. B.

ARE YOU LEADERSHIP MATERIAL?



BY MELANIE MENAGH

Do you have the traits that inspire others? Are you ready to march into the new millennium leading the information technology legions?

If you're destined for leadership, you've probably already figured out that being a technical wunderkind isn't the key. You need an array of abilities such as problem-solving, conflict resolution and communi-

cations skills, as well as business savvy — which is a key requirement.

"If you're moving into IT leadership, you have to demonstrate an ability to understand that you're running a business within a business," says Ed Toben, CIO at Colgate-Palmolive Co. in New York. "You have to look at your resources and manage that business in such a way that it can be an integral part of the larger corporation."

Business skills aren't the only thing IT leadership scouts are checking out in potential candidates. "The skill mix changes when you get into a leadership position," says Jim Miller, manager of administrative services for corporate information systems at Caterpillar Inc. in Peoria, Ill. "We stress softer skills, like communication and interaction with peers."

Established IT leaders have slightly different takes on what they're looking for in soft skills from their leader wanna-bes. But they all agree that as you climb higher on the corporate ladder, inner qualities become more important, while technical wizardry becomes less important.

"I look for people who are crisp, open, take-charge," says Frank Korahais, senior vice president in corporate systems and architecture at The Chase Manhattan Bank in New York. "You can sense that, even in an interview. Someone who can build a high-performance organization, who can pull the right resources together, look at an organism that needs to keep growing in terms of continuous improvement."

"We look for people who have a sense of urgency about what they do," Korahais continues. "That leader is someone who takes responsibility for their own destiny."

People who are going to be successful IT leaders need a keen sense of responsibility and accountability, Korahais says. "Our job is to communicate and build partnerships, to get things done, to influence the process — with the clients one supports, but also on a parallel peer level, to promote collaboration."

CIOs are hiring and promoting "people" people. "If you are going to be in a leadership role where you are managing a department, I look at people's interest in people," says Birgitta Klasen, senior vice president and CIO at Pharmacia & Upjohn Inc. in Peapack, N.J. "It says a lot about the maturity level of that person if they're interested in coaching and mentoring, helping other people to be successful."

At Caterpillar, management is actively promoting these ideas throughout the company, at all levels.

"We developed a series of courses in soft skills," Miller says. "They cover things like managing conflict, managing change, negotiating."

Champions of Change

Leaders also need a dose of creativity and vision. "A leader is a champion of change, someone who can look at a process and visualize something different, better," Korahais says. "I observe people's performance, and they should observe their own. You have to focus on results. If you observe this in your own performance, then I want to talk to you about leadership opportunities."

That person then needs to be able to be a cheerleader for change. "They have to articulate their vision in crisp messages and mobilize people toward it," Korahais says. "The leader is basically a messenger and essentially becomes the message — people follow because they understand who the messenger is and the story he is telling."

Klasen says working in sales for 10 years before moving to the technical side prepared her for a leadership role in IT in many ways.

"You really need to get people on board," she says. "If you can't explain your ideas in business terms, they won't believe you or trust you. You need to talk their language to give them that confidence."

Says Korahais: "One important thing I learned is there is no cookbook for [leadership]. We need a person who is able to manage multiple people and multiple skill sets, to find a creative way to navigate that complexity." ▸

Menagh is a freelance writer in Calais, Vt.

Tipping the Leadership Scale

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COMPUTERWORLD
THE NEWSPAPER FOR IT LEADERS

Depreciation and Amortization

BY JACQUELINE EMIGH

WHETHER you're talking about an investment in a new corporation or a patent on a new invention, most assets are more useful when first acquired than they are a few years later. Accountants use depreciation and amortization to spread out the costs of assets during the years a company uses them.

Accountants can choose from among a variety of depreciation methods, based on the specific characteristics of an asset, says Peter H. Knudson, associate professor of accounting emeritus at the Wharton School at the University of Pennsylvania in Philadelphia.

All methods try to distribute the cost or other basic value of assets, minus any leftover salvage value, over the asset's estimated useful life.

Generally Accepted Accounting Principles, a bible of sorts for certified public accountants, even lets a company use one method of depreciation in tax filings but another when reporting its earnings to shareholders. For the latter, companies will often spread some of their expenses over several years to boost profits while being honest with shareholders about the costs of doing business.

But in tax filings, companies typically want to take the biggest possible deductions as quickly as possible to lessen the tax bite (see related story, "Holding IT Accountable," page 46).

Keeping Expenses in Check

Reporting small-ticket items such as individual PCs as "expenses" is an alternative to depreciation in tax filings. But federal tax law places strict limits on the amount that can be claimed as expenses.

The government is gradually raising the ceiling on a company's overall expenses that can be written off without being depreciated — from \$18,500 in 1998 to \$19,000 this year and

DEFINITION

Depreciation is an accounting term that refers to the gradual reduction in value of tangible fixed assets such as buildings and computer systems. Amortization is similar but refers to intangible fixed assets such as patents, trademarks and copyrights.

Two Methods of Depreciation
 A company began using new computer servers on July 1, 1999. The servers cost \$63,600 and have an expected life of five years. After the five years, the servers are expected to have a salvage value of \$2,400.

Year	Computation of depreciation	Annual depreciation	Accumulated depreciation
1999*	$(\$63,600 - \$2,400) \times 10\%$	\$6,120	\$6,120
2000	$(\$63,600 - \$2,400) \times 20\%$	\$12,240	\$18,360
2001	$(\$63,600 - \$2,400) \times 20\%$	\$12,240	\$30,600
2002	$(\$63,600 - \$2,400) \times 20\%$	\$12,240	\$42,840
2003	$(\$63,600 - \$2,400) \times 20\%$	\$12,240	\$55,080
2004*	$(\$63,600 - \$2,400) \times 10\%$	\$6,120	\$61,200
TOTAL DEPRECIATION		\$61,200	

* SERVERS IN USE FOR ONLY HALF OF THE YEAR

Year	Computation of depreciation	Annual depreciation	Accumulated depreciation
1999*	$0.50 \times \$63,600 \times 15\%$	\$9,540	\$9,540
2000	$(\$63,600 - \$9,540) \times 30\%$	\$16,218	\$25,758
2001	$(\$63,600 - \$25,758) \times 30\%$	\$11,353	\$37,111
2002	$(\$63,600 - \$2,400 - \$37,111) \times 40\%$	\$9,636	\$46,747
2003	$(\$63,600 - \$2,400 - \$37,111) \times 40\%$	\$9,636	\$56,383
2004*	$(\$63,600 - \$2,400 - \$37,111) \times 20\%$	\$4,817	\$61,200
TOTAL DEPRECIATION		\$61,200	

* SERVERS IN USE FOR ONLY HALF OF THE YEAR

\$25,000 in 2003, says S. P. Kothari, professor of accounting at MIT's Sloan School of Management in Cambridge, Mass.

At the same time, prices are falling on such IT items as individual PCs. Because of the coincidental collision of these

two factors, a company might now be able to write off more computers through the expense method than before. Small businesses will be the biggest beneficiaries.

There are also different rules to distinguish between

depreciation and amortization. All intangible fixed assets must be amortized on corporate financial statements. But some of these intangible items, such as trade names, can't be amortized in tax filings. "Anything that has an 'indefinite

life' — a life that just seems to go on and on — cannot be amortized for tax purposes," Knudson explains.

As the pace of technological obsolescence has quickened, the federal tax code hasn't tended to keep pace. Under the tax laws, tangible fixed assets have been traditionally valued according to "physical life span," or the period of time they are expected to be functioning, operational or otherwise useful.

"But you might be lucky if your computer lasts two years without becoming obsolete" and needing to be replaced, Knudson observes.

In reporting earnings to shareholders, companies are more likely to use conventional straight-line methods, which depreciate the same amount of cost each year rather than depreciating more during the first few years after the purchase of a major asset. The reason: The straight-line method results in lower expenses — and, consequently, higher profits — in the first few years after the purchase. However, accountants tend to use various forms of accelerated depreciation in tax filings, especially when writing off IT investments.

Even if a company uses an accelerated method, it can switch to straight-line depreciation for the remaining life of the asset as soon as it reaches a point where straight-line depreciation allows it to write off the remaining value more quickly.

But it doesn't seem like any method of depreciation or amortization is entirely flawless. One negative aspect of accelerated depreciation, for example, is that companies write off less in their tax filings in an asset's later years — until they invest in newer assets. ▀

Emigh is a freelance writer in Boston.

MOREONLINE

For a look at other methods of calculating depreciation, visit our Web site. www.computerworld.com/more

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Dear Career Adviser:

I am a software engineer working at a database company with both Java and Oracle for Internet development. I'm interested in both languages, but I think it's important for me to be a true expert in one of them and

that it is harder to be an expert at both. I feel that Oracle database administrators or developers are better paid than Java developers. Is that true? I want to know whether I should pick Oracle or Java to make my career more stable and give me the highest pay. — HIGHEST PAY POSSIBLE

Dear Highest Pay:

You're correct regarding senior Oracle developer and database administrator pay and skills. Certainly, in this job market, knowing both Java and Oracle can make you an excellent hire. They both provide the front- and back-end knowledge for sought-after e-commerce applications.

Acquiring Java and C++ skills and knowledge is easier because they are often taught in college. "When a C++ programmer starts working with Java, most do not want to go back due to Java's ease of use. This will start to cause the salaries of Java programmers to decline," says Vlad Lyubovny, president of Emeryville,

Calif.-based technical recruiting firm Tarsius Inc.

Oracle's learning curve is fairly steep, and most companies have only one database administrator, making that person's responsibilities and compensation that much greater. Annual salaries for permanent Oracle jobs can top \$150,000 per year, with contract rates at a premium of \$125 to \$200 per hour. Although Java and C++ are certainly good, solid skills in today's job market, the consensus points to Oracle as the higher-profile career, with two significant caveats: You will need lots of stamina to acquire Oracle skills in depth, and you must love the work, because you'll be doing a lot of it.

Dear Career Adviser:

I have been a developer for just over five years and am very proficient in Visual Basic, C and Oracle PL/SQL in client/server applications. For the past several months, I've been contracting with a university to teach a client/server

development certificate course aimed at career-changers.

They're offering me a full-time position to continue teaching, run the computer labs and develop new course material. If two or three years from now I want to return to software development, will companies consider my development skills stale? — LABOR OF LOVE

Dear Labor:

A hot job market may give you the room to do what you love, but there are factors to consider. "You might lose some compensation going from industry into education on the front end and then again on the back when you return to industry, but you might also gain some strong interpersonal communication and project-planning skills that industry values," says Jay Yu, director of operations at

Global Networking and Computing Inc. in Redwood City, Calif. And hiring managers in private industry can also view the time running the lab and developing course work very positively.

But making this a no-risk move presumes that both the job market and your skill set will stay very strong and that industry will value the soft skills you picked up during your stint in education. In your return to industry, plan to demonstrate that your application development skills remain above par. Without a track record of finished projects during that period, keeping current by reading publications may not be enough to impress a hiring manager.

Dear Career Adviser:

I have two years' experience in Visual Basic and one in C++. I want to improve my programming skills and grow my career, particularly in Web-related areas. What should I do, and what will I earn? — PEORIA PRAGMATIST

Dear Peoria:

An excellent letter from a reader offers a great formula for success: "I am now a developer doing Enterprise Visual Basic and SQL applications and Web development, having switched into this ca-

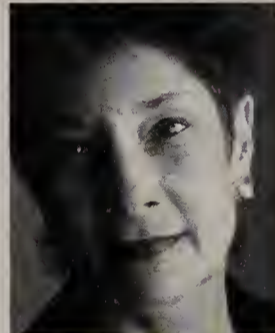
reer at age 37. These are my tips:

"First, identify the need. I quickly taught myself Active Server Pages when it was just coming into demand. Look for the newest tools and learn to use them. I also learned Visual Basic 5 and SQL.

"Then, get some experience. You must show you can use what you know. Early on, I built a few Web sites to demonstrate my Active Server Pages and ActiveX skills. When prospective employers told me what I was missing, I quickly learned those skills and added examples to my site. Meanwhile, I worked for next to nothing to add projects to my resumé.

"Find a good starting place. After trying consulting firms, I began approaching information technology departments directly. After a short stint at a small Internet service provider at \$8 per hour, I was hired to do Active Server Pages work for a municipal utility at \$18 per hour. A year later, the same company is paying me \$27 per hour and has expanded my work to Enterprise Visual Basic applications. I now get offers from \$35 to \$60 per hour.

"Finally, it's not age, gender or education that lands the job. It's having the in-demand skills and motivation to find the people who need them. Please note the importance of developing a good Web site to display your talents. Proving you have the skills will get you noticed." ▀



FRAN QUITTEL is an expert in high-tech careers and recruitment. Send questions to her at www.computerworld.com/career_adviser.

BRIEFS

Driver's License Info May Be Restricted

Companies that buy driver's license records for marketing purposes may have trouble getting that information in the near future. The U.S. Senate has approved a bill that had already cleared the House of Representatives that requires states to seek the consent of individuals before releasing any driver information. Insurance companies are exempted. The bill, which was included in a transportation appropriations bill, is awaiting the president's signature.

Borden Finds an Application Resource

ReSource Partner Inc. (RSP), an application service provider in Columbus, Ohio, has announced the renewal of an outsourcing agreement with Borden Chemical Inc., also in Columbus.

Under the terms of the agreement, RSP will continue to provide hosting and infrastructure support for Borden's PeopleSoft Inc. human resources management system. In addition, RSP will continue to support Borden's SAP America Inc. enterprise resource planning envi-

ronment and provide other information technology infrastructure services, including networking, e-commerce and Internet support.

Perot Health Care Deal

Dallas-based Perot Systems Corp. and Harvard Pilgrim Health Care in Brookline, Mass., last week announced a 10-year business and technology services agreement valued at approximately \$700 million, with incentives to reduce costs and significantly improve Harvard Pilgrim's operating performance. Perot will work with Harvard Pilgrim CIO Louis Gutierrez to develop strategic systems, improve the IT infrastructure and restructure the claims department.

New Hartford IT VP

David H. Annis has been named group senior vice president of IT at The Hartford Financial Services Group Inc. Annis, an 18-year veteran of Hartford's IT organization, will succeed John T. Crawford, who plans to retire next year after the insurer's year 2000 project is completed.

Sallie Mae CIO

Reston, Va.-based SLM Holding Corp. — better known as Sallie Mae — announced that it appointed Theresa S. Shaw CIO.

Shaw was previously a vice president responsible for application development, including the suc-

cessful delivery of Laureate, the company's new Internet-based student loan management and delivery system.

Traveling CIOs

Lexington Services Corp., a Dallas-based subsidiary of Travel Services International Inc., last week named John Schackmann its CIO. Lexington Services is the largest provider of hotel reservations in the nation and second largest in the world.

Travel, marketing and real-estate conglomerate Cendant Corp. in New York last week appointed Robert W. Mason CIO, replacing David McNicholas, who is retiring. Mason previously was CIO at MicroAge Inc. and Anheuser-Busch Inc.

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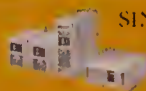


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TECHNOLOGY

SUN RISER

Pat Sueltz, the new president of Sun Microsystems' software products and platforms division and former manager of IBM's Java software division, says she'll work with anyone (even Microsoft) to popularize Java. **▶ 62**

ONE WITH THE COMPUTER

At Telecom 99 earlier this month, Compaq CEO Michael Capellas shared his vision of a future in which computing and telecommunications merge. **▶ 64**

SIMPLIFYING LIFE

Puma Technology plans to release its Intelli-sync.com service, which will let users synchronize data from their mobile devices, PC applications and Web-based content at a central Internet address. **▶ 64**

IBM, NOKIA WAP IT UP

IBM and Nokia have announced a global partnership in which IBM will market and distribute Nokia's Wireless Application Protocol server software on some of its PC servers. **▶ 64**

WEAK ON WIRELESS?

Europe may lag behind the U.S. in landline access to the Web, but the U.S. will lag behind both Europe and Asia in wireless Web access, predicts Oracle Chairman and CEO Larry Ellison. **▶ 68**

\$129B QUESTION

MCI WorldCom Vice Chairman John Sidgmore assures us that MCI WorldCom's planned \$129 billion purchase of Sprint won't result in higher prices or a decline in customer service. **▶ 66**

TO RUSSIA, WITH HACKS

Taking a giant leap forward in attack technology, Russian crackers appear to be mapping the Internet. The fact that they use their victims' own machines to scan the Web for other vulnerable systems has security experts worried. **▶ 68**

THE CHAMPIONS OF REMOTE

With the release of new versions of Traveling Software's LapLink and Symantec's PcAnywhere, the leaders are neck and neck in the areas of remote control and file transfer. **▶ 72**

QUICKSTUDY

The growing use of data warehousing technology has pushed metadata into the limelight. **▶ 74**

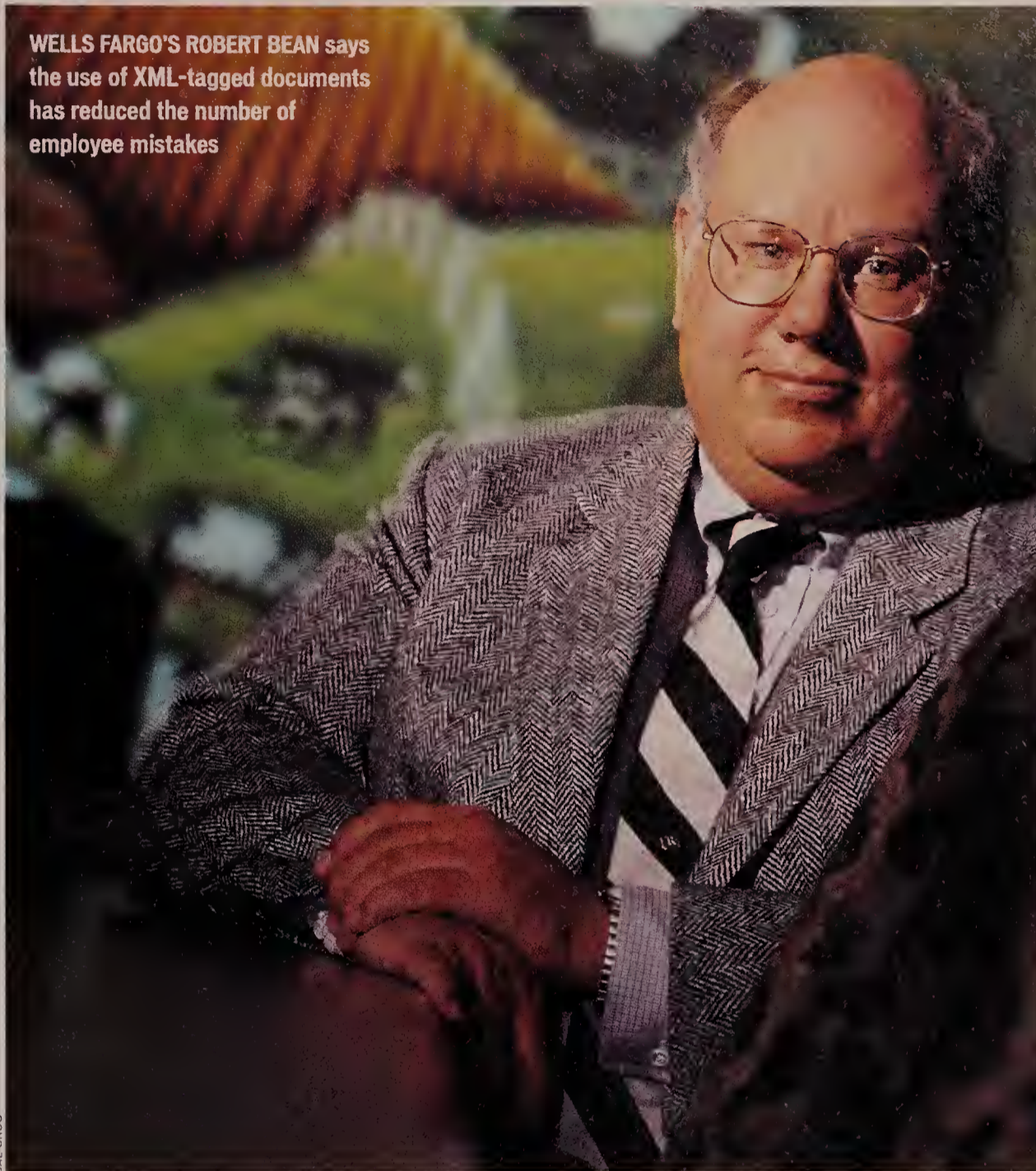
FLASHBACK

Tim Berners-Lee takes a look at the commercialization of cyberspace and concludes that there's room on the Web for both commercial and social sites. **▶ 82**

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WELLS FARGO'S ROBERT BEAN says the use of XML-tagged documents has reduced the number of employee mistakes



XML: NEW KID ON THE BLOCK

EXTENSIBLE MARKUP LANGUAGE is beginning to prove itself to be the weapon of choice when it comes to content repurposing. But questions about performance problems, maturing standards and a lack of XML-savvy applications still need to be answered before it becomes an everyday component in the corporate tool box.

76

BRIEFS

New Backup Tool

Network Integrity Inc. in Marlboro, Mass., the maker of LiveVault software, is teaming with Imation Corp. in Oakdale, Minn., to provide backup of databases such as Oracle and Microsoft Corp.'s SQL Server and Exchange. LiveVault works over IP connections as low as 56K bit/sec. by constantly backing up only the data that has changed. The service will cost \$3,600 for the storage server, plus \$2,400 per typical backed-up production server.

Web Support

Ventix Systems Inc. in Austin, Texas, has announced a version of its end-user support software for use with Internet-based applications. The software, which helps guide users through business transactions, was first released last spring for enterprise resource planning systems such as SAP AG's R/3. The AnswerWeb release is due later this month; pricing will start at \$50,000.

Red Hat 6.1 Upgrade

Red Hat Software Inc. has released a new version of its Linux open-source operating system. Version 6.1 features a slicker installation interface, online access to updates and improved system management capabilities, the company said. It also includes Sun Microsystems Inc.'s Star Office productivity application suite and full Lightweight Directory Access Protocol integration, which allows network administrators to manage distributed computing by authenticating and maintaining information about users and network services, the Durham, N.C., company said. Pricing for the upgrade starts at \$29.95.

New SmartTran Tool

EnterpriseLink Technology Corp. in Campbell, Calif., has announced Version 3.1 of its SmartTran enterprise application integration software. It introduces the ability to integrate any existing Component Object Model or Common Object Request Broker Architecture server applications via SmartScript, a server-side script language. Scripts are managed in SmartTran Builder with a new SmartScript Library Manager. Pricing starts at \$98,500.

Sun's New Java Guru Reaches to Industry

Pat Sueltz talks about her hopes to work more closely with Microsoft, IBM and HP

AFTER 20 YEARS at IBM, most recently as general manager of Big Blue's Java software division, Pat Sueltz became president of Sun Microsystems Inc.'s software products and platforms division late last month. *Computerworld* senior editor Carol Sliwa interviewed her about her new job.

Q: What are your top priorities at Sun?

A: I am still in listening-and-conversation mode. But I think that [Item No. 1] is to clearly make sure that we execute on the plans that have already been put in place, ... that we continue to deliver the quality products on schedule.

Item No. 2 is to continue to grow the Java community — to make sure that we work on compatibility, ... stability and to extend the Java community process. And that means to be inclusive — to really listen to our partners and to listen to the development community at large.

The third part of this is to really pull together that integrated development environment, the total tools package from the largest scalable server to the smallest embedded device, to make sure that we have that complete environment to help reinforce the architectures and rules of Java.

Q: Do you think you have the tools in-house to achieve that vision?

A: We have a tools organization in-house already of about 300 to 400 folks, and of course when we complete the [Forte Software Inc.] merger, which should happen by this year's end, that will add another 400 folks. I think we've got a lot of the fundamentals, and it's a matter now of integrating

things and making sure that we leverage all of the opportunities, all of the tools and technologies that we currently have.

Q: Your predecessor, Alan Baratz, told me that getting a Java Integrated Development Environment was a top priority. Will Sun have one going forward?

A: I don't know of any tools developer that doesn't think that there's always room for improvement, because the technologies keep changing. I'm going to look at an inclusive development environment that includes Java and some of the other latest technologies that are coming — including XML.

Q: Several companies, including IBM, have had some disagreements with Sun relating to the company's control of Java. What's your view now?

A: I have some great colleagues and friends at IBM that I've worked with for some 20 years, and we all worked for a common goal of building the standard of Java in the industry.

I'm expecting that things will continue to be much like a family. I don't know about your family, but I can tell you that sometimes in my family we have disagreements. But in the end, we still remain committed to that common goal.

What I intend to do is reinforce my commitment

to the partners and the development community at large and make sure that we are communicating, because we have a lot to gain for our mutual customers by working together.

Q: Can we expect to see Sun work even more closely with IBM on Java?

A: I'm an optimist. So I'm expecting that good relationships will get even closer and that there will be more collaboration. ... The beauty of Java

with all of the industry is that we have cooperation. There's good cooperation on the standards, and at the same time, there's good competition on some of the product implementations.

Q: Hewlett-Packard Co. still has its own Java efforts going on in the embedded space. Will you do anything to bring HP back into the fold?

A: HP and Sun have been good partners on Java. And we've done a lot in the enterprise space together. We have to do some more work on the embedded space, and of course my intention would always be that we keep Java together — that it be a single standard and not be fractured.

Q: How important is Microsoft Corp. to Java's future?

A: I think that Microsoft, because it's a major player in software, remains important, and that Java — and what we're standing for here at Sun — is all about including folks. It's all about cross-platform compatibility.

I would like very much to work very closely with Microsoft and keep working on the technology together.

Q: Will you make that overture to Microsoft?

A: I make an overture to everyone. This is all about what our customers have been telling us for a long time: Help us mature the software industry, help it to grow up. Let's take it to a point where customers can be concerned about the particular application they need. ▀

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Novell Plans to Introduce Network Management Tools

CEO says tools won't compete with Tivoli, CA

ROBERT L. SCHEIER
LAKE BUENA VISTA, FLA.

Novell Inc., hoping to leverage the strength of its Novell Directory Services (NDS), will release within the next three months a set of network-based tools to manage everything from single sign-on for users to digital security certificates, Novell Chairman and CEO Eric Schmidt said last week.

"We will be an infrastructure supplier" not only to corporate information technology organizations but also to application service providers, which host corporate applications and data and deliver them through the Internet, Schmidt said at Gartner Group Inc.'s Symposium/ITXpo 99 here.

Using NDS as a low-level system to track users, network devices, applications and other IT components, Schmidt said, the new tools will help IT ad-


ministrators implement features such as single log-on, which allows users to sign on only once to access all of their applications, as well as manage their public-key infrastructures for security.

When asked whether this move puts Novell in competition with systems management vendors such as Computer Associates International Inc. and Tivoli Systems Inc., Schmidt said Novell was aiming for the "low-end but high-volume" market for directory software that tracks objects such as users on a network, leaving the market for specialized management applications to more specialized vendors such as CA.

Schmidt was noncommittal when asked whether he would end a practice that requires customers to pay for a separate per-user license to run NDS on either Microsoft Corp.'s Windows NT Server or on Novell's own NetWare LAN operating system. He gave no time frame for when Novell might allow a single license for running NDS on multiple platforms. ▀



PAT SUELZ:
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Puma Starts Net-Based Synchronization Service

Lets users merge mobile, desktop and Web data from one address

BY JACK McCARTHY
SAN FRANCISCO

PUMA TECHNOLOGY Inc. in San Jose plans to release a service that will let users synchronize data from their mobile devices, PC applications and Web-based content on one central Internet address.

Called Intellisync.com, the service will let data be automatically updated across mobile devices, including wireless application protocol-based cellular phones and Palm devices.

Groupware and personal information management applications such as Microsoft Corp.'s Outlook may also be

used with the service, Tom Hunt, vice president of marketing at Puma, said last week.

Puma, which already markets software that synchronizes PCs and handheld devices and databases, will release the service early next year.

Vendors can add support for additional products by using the Intellisync Software Development Kit.

"Right now, you may have six different machines; so how do you reconcile them?" Hunt asked. "This is a destination site that allows you to get your life in sync."

The service will be offered at no charge to consumers and will also be licensed to Inter-

net sites such as The Microsoft Network, Philadelphia-based eCal Corp.'s eCal.com and Redwood City, Calif.-based TimeDance Inc., with which Puma already does business, Hunt said.

Hunt added that Intellisync.com runs its synchronization software on large Web servers so it can be scaled as needed.

One analyst said the technology offers a valuable enhancement to Puma technology.

"Clearly, what everybody would love to have is their e-mail, [cellular] phones, etc. ... synchronized on the Web," said Van Baker, director of consumer platform research at Dataquest in San Jose.

Compaq CEO: PCs, Cell Phones to Merge

Capellas predicts network will find us

BY JANA SANCHEZ
GENEVA

In the Information Age of the near future, we will be computing and communicating simultaneously from devices that today we wouldn't even recognize as computers, according to Michael Capellas, Compaq Computer Corp.'s president and CEO.

Speaking at a panel discussion about the Information Age at the Telecom '99 exhibition earlier this month, Capellas shared his vision of a future in which computing and telecommunications will merge.

"It's not about us finding a network; it's about the network finding us," said Capellas, predicting that people will expect

to be connected anywhere, anytime. Telecommunications and computing will be blended together to the point where they are indistinguishable, he said.

One possible device for such continuous computing will be similar to today's mobile phone, Capellas said, with extra buttons for nontelephony functionality. Such products

will be made in mass quantities and will be easy for the makers to roll out, he added.

In next-generation computing, intelligent devices will control service on the network, and bandwidth — once a profit center for telecommunications carriers — will become a commodity, Capellas said. Demanding customers will expect reliability and increased capacity, but the technology isn't really there yet, he added.

Knowledge about a compa-

ny's customers will be an important asset that will let businesses cross-sell and upsell products and services, said Capellas. Because of the vast amount of personal information companies will hold on individuals, storage will be a challenge. The security of that information will also be an important responsibility, he said.

However, Capellas didn't have an answer to the question of how to safeguard individual privacy rights in a world where any company can predict what an individual might buy because it knows the customer so well. "We will have to have some form of international standards," Capellas suggested.

Making a few forecasts about the Information Age, Capellas predicted that within five years, at least 60% of all calls will be made on wireless phones, and within 10 years, half of all retail sales will be made online. ▀

Sanchez writes for the IDG News Service in London.



MICHAEL CAPELLAS:
"It's not about us finding a network"

[Intellisync.com] is a destination site that allows you to get your life in sync.

TOM HUNT,
VICE PRESIDENT OF MARKETING,
PUMA

Baker questioned how the service can overcome firewalls set up to protect individual users. However, Hunt explained that users can create their personal profiles "behind" firewalls. ▀

McCarthy writes for the IDG News Service in San Francisco.

IBM and Nokia Team Up To Produce Wireless Devices

Will integrate WAP technology with IBM platforms

BY MARY LISBETH D'AMICO
GENEVA

IBM and Irving, Texas-based Nokia Corp. have announced a global partnership that they said will help companies extend electronic-business applications to a variety of mobile devices.

In a statement, the companies said IBM has agreed to market and distribute Nokia's Wireless Application Protocol (WAP) server software on some of its PC servers. IBM also plans to license Nokia's WAP technology to integrate with some of IBM's software platforms.

WAP is a set of software protocols that allow users to download Web content onto mobile phones that are fitted with a special "microbrowser." The first WAP-based phones were recently launched by

Nokia, L. M. Ericsson Telephone Co. in New York and other telecommunications-equipment manufacturers.

The Nokia WAP server software will soon be available on IBM's Netfinity servers running Microsoft Corp.'s Windows NT, the companies said.

IBM will also combine Nokia WAP technology with its middleware for what it calls "pervasive computing."

Also Planned

WAP technology will be used in new technologies that IBM is developing for wireless applications, IBM said. Those technologies include "transcoding" services, which translate documents that are written in the Internet programming language HTML into stripped-down HTML for use on handheld devices.

The deal with IBM isn't the first such linkup for Nokia. Last month, Nokia made a similar agreement with Hewlett-Packard Co. ▀

D'Amico writes for the IDG News Service in Munich.



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BRIEFS

Vixel Hub for SANs

Vixel Corp. in Bothell, Wash., has released the 2100 Zoning Managed Hub for storage-area networks (SANs), which it said offers four times the performance of a traditional managed hub at the same price. Users can divide the hub into four full 100M byte/sec. Fibre Channel loops, or "zones," compared with traditional managed hubs, which allow for only a single 100M byte/sec. loop, according to the company. The Vixel 2100 Zoning Managed Hub is now available starting at \$3,495.

AT&T, BT to Boost Joint IP Network

The head of a telecommunications joint venture between AT&T Corp. and British Telecommunications PLC last week said that by early next year, his company will double, to 40, the number of cities reached by its IP network.

Over the same period, the Concert venture will expand, to 60, the number of cities reached by its frame-relay services. That is a 50% increase from the current level, according to David Dorman, Concert's CEO. Dorman said that the venture is investing \$1 billion in its first year to build out its worldwide IP-based network and plans to invest \$3 billion over the next five years to expand its networks.

GTS Expands Data, Web Hosting in Europe

Global TeleSystems Group Inc. (GTS) in McLean, Va., has joined the wave of vendors expanding their data and Web hosting services with a plan to open four centers in Europe by mid-2000.

The first European center will be located in London and is scheduled to be operational by the end of this year, the company said last week. Additional centers in Amsterdam, Frankfurt and Paris are slated for completion by mid-2000.

GTS operates its own pan-European fiber-optic network that reaches into more than 50 cities on the continent, and the company said it serves businesses and carriers in 20 European countries, providing broadband, voice, Internet and IP services.

MCI WorldCom Responds To Sprint Merger Concerns

Both firms are said to share a strategy of voice, data and Web access on a single line

BY MATT HAMBLIN

MCI WORLDCOM Inc.'s announced \$129 billion acquisition of Sprint Corp. unleashed worries by business users about whether the move would be anti-competitive and hurt customer service.

In a *Computerworld* interview earlier this month, John Sidgmore, vice chairman of MCI WorldCom, responded to such concerns and talked about the integration of networks between the two companies, as well as the importance of wireless communications.

Q: Some businesses and analysts think the move to integrate networks between WorldCom and the networks of its various acquisitions hasn't moved quickly enough. They say difficulties with integration helped create the environment that led to the frame-relay outage of MCI WorldCom in August. What's your reaction?

A: I don't think the frame outage had anything to do with integration. There was just a bug in the Lucent Technologies Inc. software, and we never discovered it because it had never been tested at such a high scale.

When we switched to the previous software release, it went fine. So, the problem really had nothing to do with the integration.

Q: But there was an upgrade under way, correct?

A: The upgrade was simply to allow us to bring the network to a greater numbers of users.

Q: So, with 3,000 businesses affected, what was the lesson?

A: We could have handled communications more effectively and more quickly put out messages to analysts and the press when it happened. It was a dif-

ficult situation. Most of the time it was down (Aug. 5-15), most of our customers had service. Of 3,000 large accounts, not all were down at the same time. On average, 95% had ser-



MCI WORLDCOM Vice Chairman John Sidgmore: "It's absolutely critical for us to be able to provide wireless data services"

vice. We could have reloaded and restarted the entire network, but most of the users who aren't affected don't want you to do that. They want to stay up.

Q: Will refunds apply to all frame users or only to those affected?

A: The people affected will be covered. Some users didn't go down, and they won't get credit.

Q: Has MCI WorldCom been hurt by the outage?

A: Obviously, some customers are mad at us, but I don't think there will be a long-lasting effect from this. ... We will deal with customers fairly, and we'll learn, and service will be better as a result. I certainly wish it hadn't happened.

Q: What is the general plan for integrating the networks of MCI WorldCom with those of Sprint? For example, what happens to the Sprint Integrated On-Demand Network (ION) idea?

A: With Sprint ION and Digital Subscriber Line (high-speed

connections over conventional telephone lines) and fixed wireless, both companies are heading toward a similar strategy.

Regarding ION, we have had a similar strategy as Sprint in our MCI WorldCom networks. ION allows two things: One, you separate the network transport layer from the proto-

But that doesn't mean on Day 1 there will be a single network, but ultimately we will have a single organization and a single network.

Q: So, will the ION concept be sold to businesses widely? A Sprint executive said there are 30 customers, but most won't describe what they are doing.

A: It hasn't really been commercialized, so I can understand why they wouldn't talk.

Q: Many businesses don't know how they are using wireless, so is MCI WorldCom's interest in Sprint's wireless business mostly a play for consumers? Will the new WorldCom be selling wireless services in bulk to businesses?

A: The business market for wireless will be an incredible market, especially in two years when wireless data gets improved.

Two years from now, a lot more data will transmit wirelessly, so it's absolutely critical for us to be able to provide wireless data services, and it will be very important for business customers.

Q: Some businesses, even those that use only AT&T, worry about one less big carrier and see the Sprint acquisition as anticompetitive. What's your response?

A: The comments about less competition interest me. This merger allows broadband access, which is a third path into the home. It's going to be a big benefit for services and wireless and broadband across the nation.

Ultimately, these are excellent things. For the business customer, it would be hard to imagine in two years that there won't be more competitors. Not only AT&T, MCI WorldCom/Sprint, but Qwest, and Williams and Level 3 and multiple Bell operating companies [hope to be] doing the same thing. ▀

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DEBORAH RADCLIFF/HACK OF THE MONTH

Crackers Subvert Servers To Map Web Weak Spots

IN A GIANT LEAP for attack technology, crackers, possibly from Russia, are mapping the Internet. In the process, they are pinging a massive number of proxy ports, possibly in search of user names, passwords, proxy service information, vulnerabilities and other rich data that could be used to launch large-scale attacks on government and corporate sites. The attack uses a Trojan horse (hidden code) to dupe victim machines running Windows programs into probing other servers connected to the Internet and sending the information back to a main server in Russia. So far, 1,000 victims of the Trojan horse have been discovered by members of the Bethesda, Md.-based System Administration, Networking and Security Institute (SANS) — a cooperative research and education group with 62,000 members.

The Trojan horse, dubbed Ring0, or RingZero, was first detected Sept. 19, when a faculty member at SANS detected a scan on his home cable modem to ports 80, 8080 and 3128.

All of these TCP/IP ports are used for proxy services — usually firewall services that protect internal networks from being mapped, by changing IP addresses as

corporate users are connected to the Internet. Because there are well over 65,000 ports available to TCP/IP, poorly configured proxy servers could be exploited to give up sensitive user identifications and passwords.

The Shadow Intrusion Detection Team at the Naval Surface Warfare Center in Vahlgren, Va., joined with SANS to find the source of

the attack. Program manager John Green found that the port scans were coming from 500 separate machines. A mailing to SANS's 62,000 members turned up 300 who said they had been scanned on the same ports.

One SANS member found the program (Ring0.vxd) in his Windows directory and e-mailed it to Green. (Ring0 represents the highest-level

kernel access, which enables complete control of the victim machine.)

Russian Server

Green presented RingZero earlier this month at the SANS Network Security 99 conference in New Orleans, where some 50 pizza-fueled SANS members stayed up until 2 a.m. one night unleashing the program in a controlled networked environment. The group traced the program through the Internet as it sped off to deliver the information to a server in Russia (www.rusftpseach.net) that is no longer online.

"What we found was a quantum leap in attack technology. This was a large-scale, indiscriminate mapping of the Internet and connected servers," Green explained. "The program looked like it would generate about 20 random IP addresses, all on port 80, then on 8080, then on 3128. It was sequential. It would pause, like it was generating another list of random IPs, then it would go again. And it went on and on and on."

To date, automated port scanning has been conducted by individual or cooperative machines that don't have the horsepower to gather the vast amount of information needed to map the entire Internet, let alone the services and vulnerabilities within each connected machine. But the distributed nature of this attack, along with the program's ability to randomly generate IP ad-

resses, has the security community worried.

"There are entire entities out there trying to bring shape and form to the Internet. For what purpose, no one knows. But this event will force the community to move the feasibility line into what we thought wasn't yet possible," says Chris Williams, security research manager at Network Associates Inc. in San Jose.

There are some intriguing loose ends that SANS is still trying to tie up. For example, there's an encrypted data file in the Trojan horse (its.dat) that Green thinks could re-

configure the hack (such as rerouting data to different repositories should one go off-line) under specified circumstances.

And then there's the question of what exactly the attacker is after. Some suspect that the attacker is looking

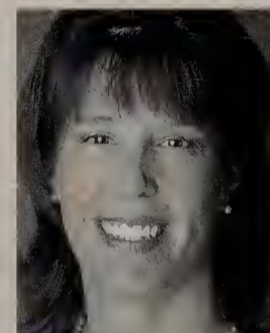
for user IDs and passwords flowing into and out of the proxy ports.

Others have suggested that the attacker is mapping vulnerable ports for future exploitation. Green has conjectured that crackers, knowing which proxy ports are vulnerable, could simply route their attacks through these ports to mask their own identities.

Users Beware

RingZero once again reinforces the need to teach users not to run untrusted executables, either off the Web or from e-mail. In addition, users should be diligent in their port protections and close ports that aren't in use.

And if you see Ring0 and its extensions (ips.exe, pst.exe or its.dat) in the Windows system directory, it's too late. You're already sending information to the mother ship, wherever that is. ▀



DEBORAH RADCLIFF is a freelance writer in Northern California. Her Internet address is derad@aol.com.

Ellison Sees American Lag on Wireless Net

Oracle chief predicts U.S. will be 'dead last' with the technology, after Europe and Asia

BY MARY LISBETH D'AMICO
GENEVA

Europe's lead in wireless digital telephony will ultimately result in there being more Internet users there than in the U.S., according to Oracle Corp. Chairman and CEO Larry Ellison.

"First comes Europe, then Asia ... [and] the U.S. will be dead last with this technology," Ellison told a packed hall earlier this month during a speech at the Telecom 99 + Interactive 99 trade show.

Ellison said he believes Europe has a two-year lead over the U.S. in digital wireless technology. Though today the cost of Internet access via fixed phone lines prohibits widespread In-

ternet usage in parts of Europe and Asia, wireless technologies will change that, he said.

Users will access the Internet in increasing numbers via a variety of wireless devices, including mobile phones, Ellison predicted.

"Most people in Europe don't have PCs. That's because you're smarter than we are," Ellison quipped. He then launched into his now-familiar criticism that desktop PCs loaded with applications are too complicated for the average user.

Ellison also didn't miss the chance to gloat over the predictions he made four years ago at the last Telecom show.

"At that time, I angered some people by saying the PC was ridiculous," Ellison said, reminding the audience about his prediction that the world would move over to a network computing model, where users access a network that stores the applications they need.

"It's happening. The desktop PC is becoming a network computer," he said.

The network computing model also makes it easier for users to access the Internet via a variety of mobile devices, Ellison said. When data and applications no longer reside on the desktop but instead are stored in centralized servers, it will be easier to access those applications through Internet appliances, he said. ▀

D'Amico writes for the IDG News Service in Munich, Germany.

Hands-Off PC Deployment Tools

Start-up Altiris promises IT shops hassle-free desktop configuration

BY AMY HELEN JOHNSON

COMPUTER dealer Propeller Inc. in Orem, Utah, offers custom configuration of each machine. What enables Propeller to do this cost effectively, says technical services manager Brenden McEwan, is a network tool called RapiDeploy, from Altiris Inc.

RapiDeploy is a hands-off installation and configuration utility, part of a set of PC administration tools Altiris first developed for in-house use. Altiris was launched in 1997 as a division of KeyLabs Inc., a software testing laboratory.

Co-founders Jan Newman and Kevin Turpin, Altiris' CEO and chief technology officer, respectively, needed to switch the operating environments for several hundred PCs in a matter of minutes for customers who booked time at KeyLabs to test their applications. Customers began asking to buy the in-house software for their own use. In August 1998, Altiris became a separate company, selling PC deployment and imaging software.

RapiDeploy is the company's automated deployment and imaging application. RapidInstall, an automation package for updating software and registry changes, and Altiris eXpress, the company's newest deployment and state management utility, are two more of Altiris' PC management products.

The key benefit Altiris products offer, according to Kevin Knox, an analyst at Stamford, Conn.-based Gartner Group Inc., is that "they significantly save on labor costs of deploying PCs; you don't have to visit the desktop." Altiris' deployment method is to load a base image of the machine's operating environment — Windows, networking and personal settings — using an Altiris boot floppy inserted in a local drive or, more recently, over the network via Intel Corp.'s Wired for Management and Pre-boot

also lets the user customize each installation. Propeller, McEwan says, takes advantage of the ability to customize each machine's network information with a unique set of parameters: Secure ID number, name, domain and IP addresses.

Altiris is a strong player in its niche — deployment and version control, with emphasis on deployment, says Knox. But Microsoft Corp. is breathing down its neck. Microsoft's Intellimirror in Windows 2000 offers some of the same functionality Altiris does, albeit only for that operating system. Microsoft doesn't directly compete with Altiris at the moment, says Knox, but it might decide to.

"It's a threat that they need to keep their eyes on," he says. Another potential stumbling block, Knox says, is if Altiris tries to position itself as a software distribution tools company, competing with more robust products like Microsoft's SMS and Novell Inc.'s ZENworks. "It's a losing battle for them," he says.

Newman isn't about to fight a losing battle. He's clear about the company's market: small and medium-size businesses and enterprise departments.

"We don't see this as an enterprise management piece," he says. Instead, Altiris products complement management applications like Tivoli and SMS. "We do stuff that they don't do well, like cloning," he says.

The company is working on future enhancements such as an application programming interface set that lets other applications plug into the Altiris environment and vice versa, says Newman.

The next big upgrade, according to Newman, is Internet-based administration. Network managers will be able to connect through the Internet and manage PCs using a browser.

"As pipes get bigger and bigger, we could take [backup, configuration and base image] data and have that available on the Internet," Newman says. "That would be useful for [Internet service providers] and [value-added resellers] who are managing their customers' PCs." ▀

Johnson is a freelance writer in Seattle.

Execution Environment.

Altiris eXpress is the company's breakthrough product, says Knox. It goes beyond simple deployment and disk imaging — a commodity market with little technical differentiation among the competitors,



ALTIRIS CO-FOUNDER AND CEO Jan Newman was looking for a better way to deploy network desktop configurations

Altiris Inc.

Location: 387 South 520 West, Lindon, Utah 84042

Telephone: (801) 226-8500

Web site: www.altiris.com

Technology: Automatic remote configuration and deployment of a new or crashed PC

Why it's worth watching: No need to visit the desktop to get a new PC up and running on the network.

Company officers:

- Jan Newman, CEO and co-founder
- Kevin Turpin, chief technology officer and co-founder

Milestones:

- 1997: Began as division of KeyLabs; first product introduced

• 1998: Split off from KeyLabs

Employees: 50, growing 150% per year

Burn money: Novell Inc. founder Ray Noorda

Products: RapiDeploy, RapidInstall, Altiris eXpress

Customers: Small to midsize businesses, enterprise departments, commercial training organizations

Red flags for IT:

- With products like Intellimirror, Microsoft has stuck its proverbial camel's nose under the tent flap of this market. If it enters, Altiris could get shoved out.
- Deployment is half the solution; software distribution and management is the rest. Altiris must ensure it works well with products like SMS and ZENworks.

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STATE OF
THE MARKET

Grabbing the Right Image

Kevin Knox, an analyst at Gartner, says Altiris' flagship imaging product, RapiDeploy, is in a commodity market. What Altiris is doing right, he says, is expanding its pure imaging product set to encompass PC state management — the ability to update, take a snapshot of and restore the PC's image — with the release of Altiris eXpress. Here's how the competition is evolving:

On Command CCM

On Technology Corp.
Cambridge, Mass.
www.on.com

On Command CCM is a central administration system that lets information technology organizations load and configure Windows operating systems, machine parameters and software on desktop PCs. Knox calls On Command CCM a "complete solution" that straddles the line between software distribution and hardware management. On Technology presents the biggest technology threat to Altiris, he says: "Frankly, I think On is technically the leader right now."

Drive Image

PowerQuest Corp.
Orem, Utah
www.powerquest.com

Drive Image concentrates on backup and system recovery. It's good software, says Knox. Drive Image has additional disk-manipulation abilities like resizing partitions and checking for bad sectors on the hard-disk media. For this reason, Knox labels it more a utility than a management product. PowerQuest wants to follow Altiris into the state management market, he says, but the company isn't moving as swiftly as Altiris. "I don't think PowerQuest has taken the next step," Knox says.

Norton Ghost

Symantec Corp.
Cupertino, Calif.
www.symantec.com

Norton Ghost works on both Windows and NetWare systems, offering rollout, configuration and restoration features similar to Altiris. Sometime during the first half of next year, Ghost will become part of Symantec's unified product line, the Digital Immune System, which is the company's integrated, best-of-breed PC protection and troubleshooting suite. Knox says that it moves such as that one that make him label Symantec the biggest marketing threat to Altiris.



The front page of the inform



Remote Control And File Transfer: Comparing the Two Champs

BY DAVID STROM

NEW VERSIONS of LapLink.com Inc.'s LapLink and Symantec Corp.'s pcAnywhere make the products close competitors in terms of performing remote control and transferring files. The products, from Bothell, Wash.-based LapLink.com (formerly Traveling Software Inc.) and Santa Monica, Calif.-based Symantec, are useful for setting up a new computer or grabbing information from your office machine when on the road or at home.

I tested the shipping Version 9.0 of pcAnywhere and a late beta of LapLink 2000 on a variety of old 486 machines and new Pentium 200-MHz Windows NT, Windows 95 and 98 PCs, over various network and dial-up connections. PcAnywhere ran slowly but adequately on my 486 machine. LapLink documentation wants at least a 100-MHz machine, although it ran adequately on a 60-MHz 486.

It had the occasional crash on my NT machine, which I attribute to the beta. I emphasize such old gear because often you'll use these products to move old data files to a newer computer.

Ease of use is a big deal with these products: You want to get them up and running quickly, get the file transfer done and move on to other work at hand. Also, the user interface with

these products has to be simple and obvious. If you're going to be doing some remote-control sessions, you want most of your screen available to view the remote computer, without a lot of clutter and menus taking up room. LapLink has better help screens but more options to configure, while pcAnywhere has a more spare user interface with minimal icons intruding on screen real estate.

Both vendors have continued to enhance their products for Internet and IP connections, along with modem and direct-cable connections.

The increasing sophistication means both programs can easily handle computers with mismatched display settings, such as a machine with a 640-by-480-pixel resolution display controlling one with an 800-by-600-pixel display. Both can also ignore the traffic generated by Windows Active Desktop, should you set up any of your machines this way. LapLink has better control over what information gets sent over the remote-control link and can block bit maps above a certain size configured by the user.

Both programs make use of various network protocols, including IPX and IP, for remote-control sessions as well as dial-up modems, infrared and direct-cable connections. LapLink also adds support for wireless modem connections, although you wouldn't want to send much data over these typically slow-speed wireless links unless you had lots of time and patience to watch the screen redraw. Because Windows NT itself doesn't support file

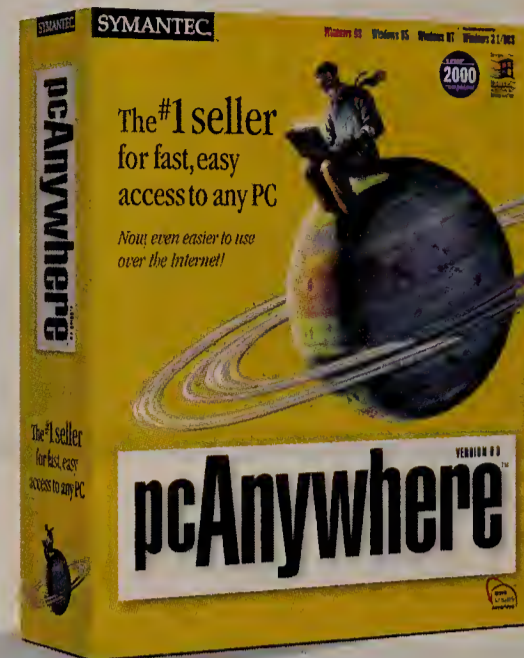
transfers over a parallel port, LapLink includes a serial cable.

In addition to basic remote control, both programs support text chat windows and voice conversations if your PC is set up with the right sound cards and microphones.

Security is certainly a concern for any corporation, and both products have several nice features that can lock things down. You can require a user name and password to connect to any computer, limit the connections via IP addresses, require the use of cryptographic certificates to authenticate users, and refuse log-ins after a specified number of failed attempts. Both programs can encrypt data over the link for further protection. They can also make use of existing user accounts in a Windows NT domain server, or you can add program-specific user names and access levels, based on the permitted functions.

You can also control what happens after each user disconnects from a session: For extra security with both programs, you can reboot your remote PC in between sessions. With LapLink, you can also protect particular folders or individual programs, such as your accounting software or certain databases, from being executed remotely. I'd rate both programs equally on the security front.

Overall, LapLink remains better at file transfer, and pcAnywhere is the champ at remote control. But the two are getting closer with these latest versions, and either program should work well for most users. ▀



PCANYWHERE has recently added improved file transfer features and text chat

pcAnywhere 9.0

Symantec Corp.
www.symantec.com
\$169

Pros: Still the best at remote control.

Cons: More cumbersome menus using a property sheet to specify connection types. Lacks support for IPX connections to Windows NT machines.

Includes virtual private network software to work with Redwood City, Calif.-based Check Point Software Technologies Ltd.'s VPN-1 Gateway (not included) and Santa Clara, Calif.-based Yahoo Inc.'s Pager software. Supports Windows NT 4.0, Windows 95/98, Windows 3.1 and DOS machines. CD comes with Version 2.0 for Windows 3.1 and Version 5 for DOS.

The package has been shipping since July 1999.

LapLink 2000

\$169.99
LapLink.com Inc.
www.laplink.com

Pros: Best at file transfer. It displays its various connection types in a drop-down menu on the main screen.

Cons: The file transfer protocol (FTP) client has annoying banner ads as part of its user interface.

LapLink 2000 includes LapLink FTP client software for file transfers to FTP servers over the Internet. Supports Windows NT 4.0, Windows 2000, Windows 95 and Windows 98.

The package has been shipping since October 1999.



LAPLINK 2000's strength lies with file transfer, but its remote control features give pcAnywhere some solid competition

Strom is a freelance reviewer in Port Washington, N.Y.

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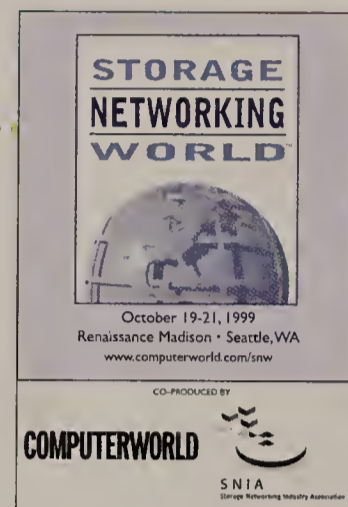
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Metadata

BY CRAIG STEDMAN

ASK AN EXPERT about metadata, and you're almost certain to be told it's like a library's card catalog. But metadata has nothing to do with books. It's all about the data your company keeps in transaction systems and data warehouses.

Metadata is a pool of information about that data, ranging from technical details such as the size of a database entry to a list of the business uses intended for different pieces of data. The descriptions guide end users to the right business data and then help them understand what the data means and how up-to-date it is.

It's not a new concept. Software programmers have long kept repositories of metadata about the code they develop, and databases contain built-in catalogs that provide basic details about the data tables set up by system administrators.

But the growing use of data warehousing technology has pushed metadata into the limelight. A good set of metadata creates the potential for faster and better decision-making because users don't have to hunt by hand for the data they need.

By itself, business data "is useless," says John Ladley, a consultant in St. Louis and a research fellow at Meta Group Inc. in Stamford, Conn. "If you just show someone a figure called 'net profit,' it's not going to light their candle. You need to put some context around it."

Query and reporting tools can reach directly into pools of metadata and present end users with a list of database fields to choose from, shielding them from the need to sift through lots of data definitions manually.

But if it all sounds simple for users, it's not so easy for those in charge of the data.

Creating metadata is often a manual job for information technology departments. Automated tools typically are limited and lack key items such as audit trails, Ladley says. About 80% of the companies he deals

DEFINITION

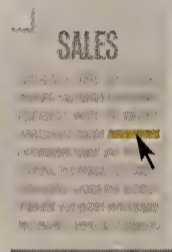
Metadata is information that describes the contents of a database. Metadata tells users when a piece of data was last updated, its format and its intended uses. That information can guide users through databases and help them understand the meaning and context of financial data, customer records and business transactions.

Metadata in Action

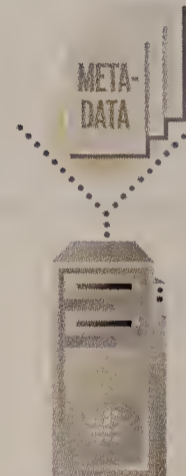
1 An end user **connects** to a report server on the corporate intranet and **opens** a sales report.



2 The user **clicks on a field** in the report to get more information about the data.



3 The report server **fetches metadata** stored in relational tables in the company's data warehouse.



4 The metadata contains information such as: The size of a data record or field • The transaction system where the data originated • How often the data is updated or recalculated • Other records that get combined to create the data • A list of reports that get combined to create the data.

5 The user can then use the metadata to **customize the report** by region, product or other categories.

Metadata at Work

Craig Bell, manager of metadata resource management at **Bank of America Corp.**, leads a team that maintains metadata for the Charlotte, N.C., company's mainframe-based data warehouse. Bell recently spoke with *Computerworld*.

Q: What role does metadata play at Bank of America?

A: When users are looking at a report, the metadata helps them understand what each [piece of data] really means. From a programmer's

standpoint, it keeps all the technical information about [the data]. And if data fields get changed, they use the metadata to understand what else will be affected.

Q: How difficult is it to create the metadata?

A: It varies, depending on the kind of metadata we're gathering. We capture some of it in an automated fashion and some of it manually.

Q: How big a job is maintaining the information?

A: There's a group of six of us. We're not [database administrators], and we're not programmers. We're

specifically metadata managers. On every project that brings data into or takes data out of the warehouse, we do an impact analysis and then we work with [the programmers] to make the technical changes.

Q: What's your group's biggest challenge?

A: Our aim is to have something in the data warehouse only once, so that everyone is working off a common set of data. We spend quite a bit of time making sure new information really is new and not just something that already exists under a different name.

with build most of their metadata collections by hand.

Maintaining metadata is also no picnic. Changes in business systems beget changes in the transaction data they produce, which means the metadata also has to be adjusted. At Bank of America Corp. in Charlotte, N.C., that's a six-person job (see "Metadata at Work").

"One of the major pitfalls is that [companies] start out very enthusiastically, but then they don't bother to keep their metadata up-to-date," says Carl Olofson, an analyst at International Data Corp. in Framingham, Mass. "And that makes the metadata irrelevant."

Another issue is a lack of standards for exchanging metadata among different systems. Most data warehousing vendors and developers of tools that move data from transaction systems to decision-support databases currently use proprietary metadata formats.

Two major groups have proposals for standard metadata in the works. One originated at Microsoft Corp. and is backed by the Meta Data Coalition, an Austin, Texas-based group of 50 vendors and users.

A competing specification, proposed by IBM, Oracle Corp., Unisys Corp. and other vendors, was submitted last month to the Object Management Group consortium in Framingham, Mass.


Both proposals are based on the Extensible Markup Language (XML) technology for exchanging data. Individual software vendors are also working on metadata extensions of XML. And several vendors are supporting both the Meta Data Coalition and the IBM/Oracle proposals.

But for now, the whole metadata standards process is mostly "a work in progress," says Lou Agosta, an analyst at Giga Information Group Inc. in Cambridge, Mass. ▀

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XML

Xtends Its Reach

By Amy Helen Johnson

XML finds favor in many IT shops, but it's still not right for everyone

EMPLOYEES NEED several hundred pages' worth of products, policies and procedures to serve customers of San Francisco-based Wells Fargo & Co. But the information in those pages changes frequently, so if it can't be updated easily, it's virtually useless.

Enter XML.

Robert Bean, vice president at Wells Fargo's Minneapolis-based institutional trust division, says the bank solved its updating problems by putting service information into a database of Extensible Markup Language (XML)-tagged documents on the company intranet. An employee who needs the latest policy or form simply aims his Web browser at the online manual. "The most current version is resident in one spot," says Bean. That means employees make fewer mistakes than before.

Content management is one of the things XML does best. Nearly every large company interested in messaging, component technology or the Internet is building XML applications, says Mike Gilpin, an analyst for application-development strategies at Giga Information Group Inc. in Cambridge, Mass. But early adopters are finding that today's XML picture isn't all rosy; the current state of XML standards and applications is about where the Internet programming language HTML was years ago, and that's not saying much.

Unlike HTML, XML makes it easy to quickly locate and reuse data. An XML listing in a catalog might label tags denoting the manufacturer's name, product name, product size, composition, shipping weight and price. You not only have the actual data, but you also know what that text means. Other applications can access that catalog and use the same information.

That's a marked contrast to HTML, which can describe only how to display the content. There is no difference among pieces of content.

That's why manipulating content in an HTML environment — to repurpose it, search it and display it in different formats — is so difficult. XML offers the self-describing capabilities that can solve that problem. A catalog listing can be repurposed to select all instances of a particular product, select weights and prices of each and perform a cost-per-pound comparison.

Wells Fargo's XML application is relatively straightforward. But XML's

BEFORE USING XML, Wells Fargo employees kept information in several binders. Now, Robert Bean, vice president of product development, says, "The most current version is resident in one spot"



ability to act as a universal framework for swapping data among applications is a hot topic in information technology shops these days.

Gilpin says corporate moves to XML for application integration are "solidifying quite rapidly." Companies that might have traded data via comma-delimited ASCII files a year ago might use XML today.

Unfortunately, the amount of HTML-to-XML conversion needed to make XML useful as a corporate data repurposing tool is staggering. There are few native XML parsers, the tools that read tags and use the data they contain intelligently, so it's not easy putting

XML on the screen. Most applications still need an extra conversion step to translate XML into HTML before use.

That extra step in HTML translation can mean slower performance. And because the object databases that store XML data and tools aren't as well-tuned as their database and HTML cousins, performance can again be a problem.

XML standardization efforts haven't really caught on; organizations find it easier to create custom tags and just map data to achieve interoperability.

At Chipshot.com, a custom golf equipment manufacturer in Sunnyvale, Calif., using XML tags to identify the

different pieces of its Web-site content made it easy to create a second site for Japanese-speaking customers. Tagging let Chipshot choose only the items that needed translating, says Nick Mehta, vice president of marketing. Now the company can just as easily create a site in Spanish or German, he adds.

Chipshot chose the XML option because only certain information had to be in Japanese, so it was inefficient to give all the pages to a translator. "If we had to manually maintain two current versions of the site, it wouldn't have been feasible," Mehta says.

In Wells Fargo's case, an XML in-

Continued on page 80

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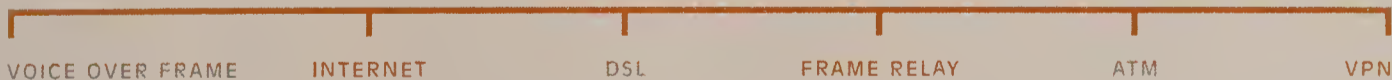
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Ingenta Ltd.

Primary goal: Build Web pages dynamically from multiple XML-tagged sources.

Greatest benefit: Repurposing. Using XML allows Ingenta to present the same content in different formats for different audiences.

Tool box: Sun Microsystems Inc.'s Enterprise 450 server running Solaris 7 operating system; Netscape Communications Corp.'s Web server; Boston-based Inso Corp.'s DynaBase XML content management system.

Alternatives considered: Ingenta evaluated many relational database management systems, such as Austin, Texas-based Vignette Corp.'s StoryServer. Ingenta rejected StoryServer, says **Don Klein**, manager of new-media services, because it didn't work with the multiple media types Ingenta uses.

Biggest hurdle: Content must be converted from XML to HTML to work with many browsers.

Ingenta Ltd. in Oxford, England, has long been the place to go to get electronic versions of medical, technical and scientific research in the U.K. But the front end of the service was written in the days before the Web became the pre-eminent method of publishing online, says CEO **Mark Rowse**. Its inflexibility was limiting the company's ability to make the interface user-friendly. Plus, Ingenta had new markets it wanted to enter, such as vertical portals for specific scientific disciplines — nutrition, veterinary science and so forth — and electronic communities for scientific societies. The idea, says Rowse, was to comb through its existing stores of abstracts, journal articles, conference proceedings and technical papers for information relevant to a narrow topic and put it on-screen. What the company needed was a way to store and aggregate content that could adapt to different presentation formats.

Ingenta's solution was to mark its presentation-level information (help files, editorials and so forth) with XML tags and store it in **DynaBase**, a content management system from **Inso Corp.** All the presentation elements (templates, GIFs, JavaScript) are held in DynaBase's object database, along with the presentation-level content files. When a page is requested by an end user, DynaBase converts the XML content to HTML, combines it with presentation elements and passes the package to Ingenta's Web server for display.

XML, says Klein, can manage large amounts of content dynamically. Because Ingenta can identify what a particular piece of text is — title, author name, abstract, bibliography, equation, article body — it can pick out particular items from the database and easily repackage the information. Klein says Ingenta can combine information from a general portal on veterinary medicine and a specific one on animal nutrition to create a new one on keeping cats healthy.

Ingenta spent more than six months looking at various options before deciding on an XML-based object-repository system, says Rowse. According to Klein, the most viable option to XML was an RDBMS, such as

Vignette's StoryServer. RDBMS works well in high-volume Web sites, but it doesn't offer the flexibility to work with multiple media types, which was a must-have for Ingenta, Klein says. Although the company would put the presentation content into XML — the items that appear on the upper-level Web pages — the meat of the site is print sources from scientific publishers, which send information to Ingenta in a variety of non-XML electronic formats, such as abstracts stored in database files and research journals in PDF.

In order to retrieve this content from non-XML data stores and combine it with the XML-tagged presentation content, Ingenta built an interface into the non-XML data stores using primarily Java and Java Database Connectivity. Ingenta leverages XML messaging abilities at this point, using XML messaging to pass search requests and results back and forth between DynaBase and the legacy systems.

Ingenta built its XML system using three full-time people, Klein says — a C++ programmer; a Web developer working on Common Gateway Interface scripting, HTML and the like; and a systems administrator to maintain the server. Klein says that in addition to Java and Java Database Connectivity, Ingenta used DynaBase's scripting language, DSL. He describes it as "quick and simple," similar to Visual Basic and JavaScript in syntax. However, he says he wishes the scripting components could be handled directly by an open-standard language, such as Java or JavaScript.

Klein says XML allows Ingenta to combine published content with user-generated content, such as threads from Ingenta-hosted discussion groups. The company has a custom software utility that takes an e-mail sent to one of its discussion groups and tags the contents with XML before storing it. Often these threads, which consist of exchanges among leading scientific researchers, are an education in themselves. By tagging them with XML, Ingenta can easily access the content and combine it with journal articles for a richer information stream.

Ingenta has had some problems, though. One major consideration was that few browsers natively render XML, so the Web pages had to be converted into HTML before displaying them for end users. DynaBase takes care of this step, Klein says. Ingenta has also defined most of its own XML tags, using standards only for rendering equations, such as in math and chemistry articles.

Object databases like DynaBase don't have a proven history of high performance, like relational database systems, Klein says. But Ingenta had overriding flexibility needs and was willing to serve the page a little slower in order to get the ability to combine content from multiple sources and repurpose it at will. Klein says DynaBase's caching takes care of some performance issues.

Klein says an XML-based package is so vendor-neutral and flexible that Ingenta could change content management applications, add new data sources and launch dozens of portals without making significant changes. "It makes it future-perfect for us," he says.

— Amy Helen Johnson

CASE STUDY

XML Xtends Its Reach

Continued from page 77

tranet was the best way to disseminate frequently changing information to 1,200 employees in 21 states. The first attempt at supplementing the binders was to build a static HTML Web site, but information was often outdated by the time it was posted, says Ben Moore, a managing associate at New York-based Micro Modeling Associates Inc., the consulting firm that helped build Wells Fargo's policies and procedures site. And there was yet another twist: Wells Fargo wanted to present a different view of the content based on specific roles in the organization. A branch manager might see activity report forms that go to upper management, while customer service representatives might see blank loan applications. Such dynamic capabilities are better suited to dynamic XML content stores than static HTML, Moore says.

Employing consultants like Micro Modeling Associates is common practice among corporations that are starting to use XML, as is the use of third-party products designed for nondevelopers. Enterprises were once stuck with using basic text editors to create XML content, much like the early days of HTML. Nowadays, they can choose from several user-friendly tag editors such as Burlington, Mass.-based ArborText Inc.'s Adept, San Jose-based Adobe Systems Inc.'s Framemaker+SGML and Toronto-based SoftQuad Software Inc.'s XMetaL.

Once the tags are added, applications that can use that data are needed, which fuels the rise of another XML product category: content repositories and integrated development environments. In this space are Burlington, Mass.-based Object Design Inc.'s eXcelon (which Wells Fargo uses), Boston-based Inso Corp.'s DynaBase, San Mateo, Calif.-based Poet Software Corp.'s Content Management Suite and San Diego-based Chrystal Software Inc.'s Astoria, among others.

Major vendor support is critical for

XML to achieve corporate acceptance, and it's happening faster than many predicted. Microsoft Corp. and IBM, for example, are pushing hard to own the XML market. IBM has a wide range of XML-enabled products, from its WebSphere application server to the XML Productivity Kit for Java, for writing XML processing applications in Java. Microsoft is working on the BizTalk Server — an XML processor that parses the XML, maps tags and sends the data to an application — and has enabled a wide range of products such as SQL Server and Office 2000 for XML.

Ingenta Ltd., a vendor of scientific, medical and technical articles in Oxford England, adopted XML for its online publishing architecture, choosing DynaBase as its repository and development system. Mark Rowse, the company's CEO, says a key benefit to using XML is the ability to pass data objects among different subsystems within the Ingenta service. "There's much less conversion," he says. "It's easier to get modules to talk to each other."

Passing XML data objects is also used to integrate back-office business-to-business systems. Atlanta-based Clarus Corp. sells a commerce suite and procurement system that relies on XML documents and Microsoft's Message Queue Server to share information among customer-facing systems and enterprise resource planning applications.

Portsmouth, N.H.-based Bowstreet focuses on a slightly different business-to-business niche: extranets. Not only do applications within the enterprise need to share data, but a company may want to share data with partners and customers. That's the case at Milpitas, Calif.-based NetRatings Inc., which measures audiences for Internet sites. The company stores its raw data in an

JUST THE FACTS

Pros and Cons

Why XML is a good idea:

- Its self-describing tags identify what your content is all about
- Data is easily repurposed via tags
- Creating, using and reusing tags is easy, making XML highly extensible
- XML data types map easily among different applications, so it's very interoperable
- It makes transferring data easy; simply give it XML tags

Why it may not be such a good idea for your application:

- Majority of online browsers still see only HTML; you will need to add an XML-to-HTML translator
- Performance is still slower than equivalent HTML documents
- The XML-tagged document is still rare; you will likely be doing a lot of conversion of older data
- Standard tag sets for different applications and industries aren't in widespread use yet

Oracle database, generates reports that the Bowstreet package converts into XML, then sends the data objects to their customers.

The advantage of XML, says NetRatings CEO Dave Toth, is that his customers — Internet advertising agencies that track the reach of their online ad campaigns — can import the audience information into their internal applications for processing. Advertising agencies then massage the data and present reports to their customers.

Software vendor WebMethods Inc. in Fairfax, Va., also uses XML as the common information description language in its business-to-business application integration product. Like other XML packages, it relies on XML standards to avoid interoperability problems. These efforts generally focus on two pieces of the XML puzzle: the XML framework, which is grammar for the XML language, and industry-specific tags, which are the industry's dictionary of XML tags that comprise the framework.

Standards groups abound to deal with these problems from an application-integration and e-commerce perspective: The Organization for the Advancement of Structured Information Standards; Microsoft BizTalk; RosettaNet, a nonprofit organization in Los Angeles; and Open Applications Group are among the largest.

At the same time, HTML itself is getting an overhaul to become more XML-like. Last August, the World Wide Web Consortium (W3C) issued XHTML 1.0 as a proposed new standard. W3C has targeted XHTML as a chief migration tool for bringing the vast archives of HTML documents into the XML world; pages developed in XHTML 1.0 instead of the current HTML 4.0 can be processed by standard XML tools without becoming completely useless to older HTML-only technologies.

But many corporations today are building effective XML utilities without waiting for standardization. Moore points out that it's easy to map one application's tag set to another if tagging standards change. "XML is flexible enough, as long as I follow a high-level set of rules," he says.

Gilpin agrees. Companies aren't looking for external definitions of XML tags, he says. They're building their own sets of tags for internal use and translating them to communicate with external partners, he says.

Although enterprises are gaining benefits from adopting XML, they have also encountered some pretty thorny problems. One of the worst: figuring out how to get the information that's stored in a variety of document formats converted to XML-tagged documents. At Wells Fargo, Moore says, technicians ended up using brute force

to bring data into XML; they simply typed everything into an XML format. Such labor-intensive conversion methods can hold back XML adoptions for many IT shops. XML has barely penetrated the vast established base of Web browsers and other HTML tools, which means XML data may not display properly in all applications. Older browsers don't natively render XML, points out Don Klein, Ingenta's manager of new media services. Ingenta still has to convert XML to HTML on the fly. That's one feature to look for in an

XML application server. DynaBase does the conversion for Ingenta, Klein says. "The trick is how well the system does it, and so far we have been pleased."

Then, too, says Klein, overall response time of XML applications slows as the data store grows larger. Object databases, which store XML content, aren't as highly tuned as standard SQL-based relational database management systems. "Using XML is not necessarily proven in terms of performance," he says. Ingenta is trying to speed things up with DynaBase's caching features.

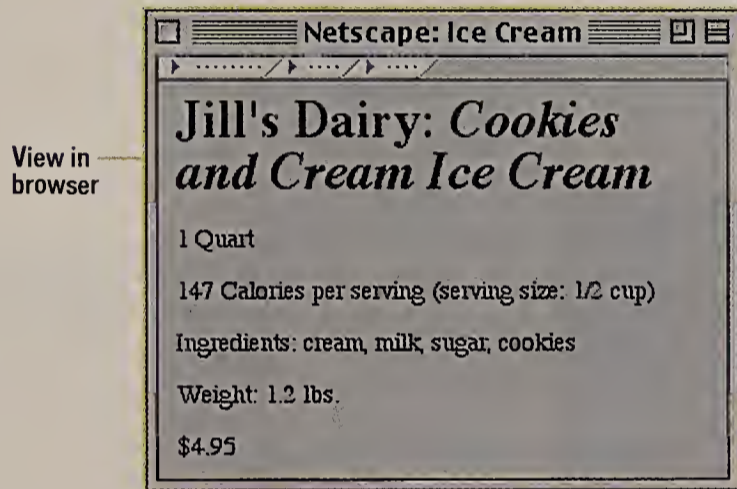
NetRatings also suffers from performance problems. It's an inherent problem when dynamically rendering XML pages, Toth says: "Computers only compute so fast."

Most say these problems will disappear as XML settles in. IT executives like Wells Fargo's Bean are enthusiastic about XML. "We have gotten what we were looking for," he says. "[We have] one place to look up the procedures and forms to do something." ■

Johnson is a freelance writer in Seattle.

What's the Difference Between HTML and XML?

As shown below, either HTML or XML can be used to create what you see in the browser window. And at first glance, HTML might look much simpler. XML's usefulness, however, comes into play when you look at the greater whole. Just think of Web search engines. If you're looking for ice cream with a certain retail price threshold and particular ingredients, an XML search engine could carry out such a request, while an HTML search engine could do only a brute text search. Because XML describes data, it can support a wide variety of uses for that data.



View in browser



Instead of describing formatting, **Extensible Markup Language (XML)** describes the content, both in explicit terminology and in implicit nesting structure. How the information is portrayed is left to the XML parser (similar to a Web browser).

Advantage: XML can be easily repurposed or translated to any medium.

Disadvantage: XML as a standard isn't set yet; XML parsers aren't very widespread.

```
<?xml version="1.0"?>
<MANUFACTURER>Jill's Dairy
  <PRODUCT>
    <CLASS>Food
      <TYPE>Ice Cream
        <FLAVOR>Cookies and Cream</FLAVOR>
      </TYPE>
    </CLASS>
    <NAME>Jill's Ice Cream: Cookies & Cream</NAME>
    <VOLUME units="quarts">1</VOLUME>
    <WEIGHT units="lbs">1.2</WEIGHT>
    <FEATURES>
      <CALORIES units="cals">1176</CALORIES>
      <INGREDIENT1>cream</INGREDIENT1>
      <INGREDIENT2>milk</INGREDIENT2>
      <INGREDIENT3>sugar</INGREDIENT3>
      <INGREDIENT4>cookies</INGREDIENT4>
    </FEATURES>
    <PRICE units="USD">
      <WHOLESALE>$3.12</WHOLESALE>
      <RETAIL>$4.95</RETAIL>
    </PRICE>
  </PRODUCT>
</MANUFACTURER>
```

Begin XML document

Units explicitly defined

Begin features

End features

Nesting structure indicates information hierarchies



In the Internet programming language **HTML** version, the formatting is explicit: What you see is what you get. It's fine for static pages that are read by a browser.

Advantage: Easy to create.
Disadvantage: Hard to repurpose.

```
<HTML>
<HEAD>
<TITLE>Ice Cream</TITLE>
</HEAD>
<BODY>
  <H1>Jill's Dairy: Cookies and Cream Ice Cream</H1>
  <P>1 Quart
  <P>147 Calories per serving (serving size: 1/2 cup)
  <P>Ingredients: cream, milk, sugar, cookies
  <P>Weight: 1.2 lbs.
  <P>$4.95
</BODY></HTML>
```

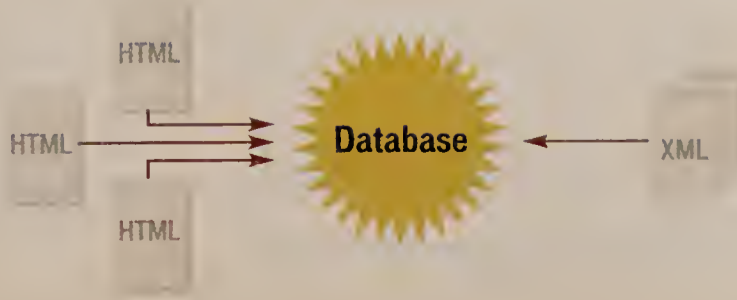
Begin HTML document

Begin headline format

New paragraph

HTML

HTML pages are portable and easy to use. But they offer little content management.



Note: Red arrows indicate processing

XML

XML pages can share a common data structure, which makes updating or repurposing them easier. They can just as easily drive Web pages as electronic or print catalogs.

Technology Happenings

■ **Cisco Systems Inc.** goes public at \$18 per share.

■ **Toshiba Corp.** unveils a RISC-based laptop, **SPARC LT**.

■ **IBM** unveils the **RS/6000** RISC-based workstation line.

■ **AT&T Corp.** makes a \$6 billion hostile takeover bid for **NCR Corp.**



■ Amid a \$10 million publicity blitz, **Microsoft Corp.** introduces **Windows 3.0**, enabling users to run multiple applications simultaneously on **Intel Corp.**'s 80386 platform. The operating system also features a revamped interface and allows PCs to support large graphical applications for the first time.

■ The **PCMCIA card specification Version 1.0** is released, carving a standard for credit-card-size devices for laptop computers.

■ **Lotus Development Corp.** establishes a day care center for employees' children.

■ The **Institute of Electrical and Electronic Engineers Inc.** approves the **10Base-T** Ethernet specification.

■ Mitch Kapor and Stewart Brand start the **Electronic Frontier Foundation**.

■ The first commercial provider of dial-up Internet access, dubbed **The World** (<http://world.std.com>), goes online.

■ **Arpanet** ceases to exist.

■ **Internet search program Archie** is released by Peter Deutsch, Alan Emtage and Bill Heelan at **McGill University** in Montreal.

■ **Motorola Inc.** begins shipping its 68040 microprocessor.

Other Notables

Nobel Peace Prize winner: Mikhail Gorbachev

Nobel Prize for Literature: Octavio Paz of Mexico

Best Picture: *Dances with Wolves*

■ Flashback is produced with the assistance of The Computer Museum History Center in Mountain View, Calif.

The Way the Web Was Won

BY LESLIE GOFF

LIKE MOST turning points in the history of computing, the development of the World Wide Web in 1990 was less of a Big Bang and more of a new fusion of many ideas that had already existed for a long time.

There "was no 'Eureka!' moment. It was not like the legendary apple falling on Newton's head to demonstrate the concept of gravity," writes **Tim Berners-Lee**, the physicist and researcher who developed HTML, in his new book, *Weaving the Web: The Original Design and Ultimate Destiny of the World Wide Web by Its Inventor* (Harper Collins, 1999).

It was instead "a growing realization that there was power in arranging ideas in an unconstrained weblike way," Berners-Lee writes. "The Web arose as the answer to an open challenge, through the swirling together of influences, ideas, and realizations from many sides, until, by the wondrous offices of the human mind, a new concept jelled."

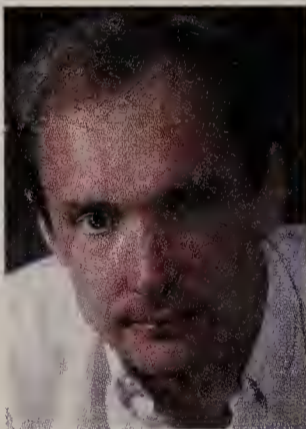
Working under the NextStep operating system on a Next workstation, he developed HTML as well as a Web browser-editor and the communications software defining Web

addresses and HTTP.

"I happened to come along with time, and the right interest and inclination, after hypertext and the computer had come of age," Berners-Lee writes. "The task left to me was to marry them together."

CERN, the European Particle Physics Laboratory in Geneva, where he was working, hooked up the first Web server in 1991, and the number of hosts had swelled to 1 million within a year. In 1993, traffic on the Web grew 341,634%. And the rest is history — history still in the making.

Now director of the World Wide Web Consortium in Cambridge, Mass., Berners-Lee spoke with *Computerworld* about the continuation of his vision.



TIM BERNERS-LEE: "The Web arose as the answer to an open challenge"

Q: How has the growth rate, both in numbers of sites and users, measured up against your initial expectations?

A: I didn't have any initial expectations, no five-year plan for the Web revolution. But after three months of continuous 1,000% annual growth in the load on just the first Web server, I got used to that rate of steady explosion.

Q: In the book, you say you have little time for the attitude that "commercially motivated material polluted the Web." What

were your original expectations regarding the level of commercial activity on the Web?

A: The Web is universal — it allows for all forms of expression and social interaction. I didn't have any specific expectations about how much it was to be used — for commercial or any other use. For all I knew, it was going to collapse after a few months.

Cyberspace isn't a limited resource like land, which if taken by a shopping mall isn't available for a park. If you see a lot of commercial sites, that is because you choose them. The free, the personal and the academic sites are still there, and indeed, proliferating.

Q: Where do you think the balance lies between commercial activity on the Web and your original motivation to enable "communication through shared knowledge [and] collaboration among people at work and at home"?

A: The balance does not have to be defined. In a balance, when commercial traffic goes up, collaborative traffic goes down. This is not the case; they are not competing.

In fact, there is a huge commercial value in collaboration. The company which learns to use the Web to work together better may be the company that survives.

This is true externally as

well as internally. When a salesperson finds a deal with a buyer, they are working together to find a good solution to a problem.

Q: But a lot of users are likely to think of the Web more as an extension of their television or radio — a place to buy and sell. And with the rage over Internet start-up stocks, talk about shifting paradigms has dissolved into stock speculation. What are your thoughts about how we can continue to achieve new levels of connectedness and collaboration without eschewing the commercial aspects of the Web?

A: The stock speculation is the market-visible sign of the

paradigm shift in society and corporate structure, which the Web allows. Depending on who you are, you may talk only about that surface phenomenon, the excitement meter of Wall Street, or you may be more interested in the change underneath.

When asked to define the Web site, hopefully the CIO will know that this is going to be a job of defining the company. It will involve internal staff areas, areas for working with partners and external public areas, all interlinked. I used to hope that the Web would become an accurate mirror of an organization; now I realize that it is, in fact, becoming the organization, as more and more of the interactions which define a company actually happen in the Web. ▀

Goff is a frequent contributor to Computerworld. Contact her at lgoff@ix.netcom.com.

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For an expanded look at how the Web was created, visit our Web site. www.computerworld.com/more

Washington Mayor Marion Barry is arrested on drug charges.

The Hubble Space Telescope is launched.

Operation Desert Shield begins when President Bush orders U.S. troops to protect Saudi Arabia.

JANUARY FEBRUARY MARCH APRIL MAY JUNE JULY AUGUST SEPTEMBER OCTOBER NOVEMBER DECEMBER

• Soviet communists relinquish monopoly power, clearing the way for development of a multiparty system.

• South Africa releases Nelson Mandela after almost 28 years in prison.

Czechoslovakia holds its first free elections in 44 years, electing Vaclav Havel president.

Margaret Thatcher resigns as Britain's prime minister; John Major succeeds her.



Future Web

If you want to cash in on the Web, the experts say to focus on e-commerce skills

By Jill Vitiello

NO MATTER WHAT information technology job you are doing now — stop!

Ask yourself this question: "How does my work support the organization's e-commerce initiative?" If the answer is, "It doesn't," this may be the ideal time to consider adding new Web development skills to your portfolio.

"Every company that does business-to-business or business-to-consumers is developing an e-commerce Web site," says Richard Wonder, president of Richard Wonder & Associates, a technical recruit-

One small company is looking for five Web project managers and nine Web programmers. A brokerage firm wants 35 Web developers and 12 Web managers for its online trading application. Another company has interviews scheduled with 11 Web developers and has already placed orders for 30 more.

Sure, these same Web skills are used in enterprise resource planning and intranet projects. But by far, most demand is coming from e-commerce initiatives, which are potential profit centers.

Skills Needed

The most popular — and therefore, most scarce — skills are Java and C++, followed by databases such as Oracle, Sequel and Sybase. "I look for people who understand the fundamentals of the whole model," says Bela Labovitch, director of Web development at Toysmart.com in Waltham, Mass. Web professionals there must understand all three tiers of the e-commerce architecture: SQL Server, middleware and the front end.

Labovitch earned both her bachelor's and master's degrees in computer science. "I learned the good fundamentals of programming models, and I carry those principles with me to whatever work I do," she says. "The code base has to be clean, scalable, reliable and reusable so I don't have to do the same thing 15 different times."

The evolution of Java attracted her to guide her career toward Web development and then on to e-commerce. "It excites me to keep on the cutting edge," Labovitch says.

Still not convinced? Listen to the hiring managers:

■ "Electronic commerce is the key to the success of our business going forward," says Julie Bartels Smith, a spokeswoman at American Century Investments in Kansas City, Mo.

■ "E-commerce is revolutionizing the way we'll do business

in the future," says Rich Holbach, Internet marketing manager at J. C. Whitney & Co., an automotive aftermarket cataloger in Chicago.

■ "The Web won't go away. It will just become more and more compelling," says Labovitch.

Young Industry

Because e-commerce is still in its early youth, there's no ready talent pool of IT professionals who have been there and done that. "Most people haven't had e-commerce experience, so employers are flexible about requirements," says Kristin Shaw, a recruiter at Aquent Partners, a technical recruiting company in Seattle. Companies want people with some Web experience, "preferably interactive sites as opposed to static sites," she says.

"If I were an Internet project manager, I'd look for an e-commerce project to work on right now," says Wonder. "Three years from now, prior experience will be a requirement."

Today, prospective employers would "rather see the Web sites you've developed than your diploma," says Shel Holtz, president of Holtz Communication + Technology, a Web consulting company in Concord, Calif.

"No one is impressed with a master's degree in e-commerce business administration vs. a hot programmer with ideas and energy," Holtz says.

In two to four years, however, that view may change as employers request proof of competency through accreditation and certification, says Tom Linde at Aquent.

As Web evangelist, Linde's job is to track and interpret IT and Internet trends and create synergies with other organizations. Currently, he's working on a committee with the Association of Internet Professionals (www.association.org) to hammer out standards for Web professionals. ▀

Vitiello is a freelance writer in East Brunswick, N.J.

Got Web?

Even if you don't have Web experience, technical recruiters say you can use your skills as a passport to dot.com nation following these tips:

1. Find a nonprofit organization or a start-up that's hungry for some help but can't afford to pay for it. Create a great Web site and use it to generate a paying position, says Shel Holtz.

2. Read, keep up with the industry, experiment, find what you like to do, then get your foot in the door and grow into the role you want, says Bela Labovitch.

3. Focus on the job titles of the future: Web merchandiser, Internet strategist, Net operations manager. Those are the e-commerce positions companies will need to fill, says Rich Holbach.

4. Take on an internship while you're a student. Visit www.icentro.com for a look at some options. An internship can be a gateway job, says Kristin Shaw.

Web Skills For the Future

IT professionals who want to work on Web and e-commerce initiatives need to have "whole-picture" skills.

Learn middleware: "Companies aren't going to rewire 20 years' worth of legacy systems. They are retrofitting front-end portals to those systems using middleware," says Richard Wonder.

Pick up the pace: "The dot.com environment requires the ability to keep up with the pace, which can be grueling," says Labovitch.

Prepare for personalization: "E-commerce and its emphasis on customer relationship management is driving technology toward personal portals," says Mary Kelley, president of Digital Worldwide at Foote, Cone & Belding Inc., an advertising firm in New York.

Multitask with new media: "Convergence will continue," says Tom Linde. Expect to juggle roles in media, databases, inter-networking, systems, programming and marketing — Jill Vitiello



TOYSMART.COM'S BELA LABOVITCH: "I learned the good fundamentals of programming models, and I carry those principles with me"

ing firm in New York. "E-commerce is the most significant trend going forward."

Help Wanted

To establish an e-commerce presence on the Web, companies are furiously hiring IT business analysts, Web designers, developers, architects and administrators. Wonder reports that his firm is inundated with requests for experienced IT professionals who can help create "e-commerce solutions."

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Software Engineer: Design, develop and implement software systems to determine feasibility of design and directs software testing procedures, programming and documentation. Work involves extensive travel and frequent relocation. Must have six months of experience as a software engineer or computer professional in addition to six months of experience using SAP and related software. Bachelors degree or foreign equivalent in Computer Science/Applications, Engineering, Chemistry, Math, Physics or a business related field. Salary is \$82,500 per/yr, 40 hrs/wk., 9:00-5:00 p.m. Please submit resumes to: Ms. Charlene Cogley, Mgr., Beaver Falls Job Ctr., 2103 Ninth Ave., Beaver Falls, PA 15010; Job Order No.: 7056106.

Programmer Analyst - Oracle Specialist - Multiple Openings

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Programmer Analyst - BAAN Appln. Consultant: Implementation of the BAAN Enterprise Resource Planning (ERP) package using the structured BAAN implementation methodology involv'g Software Selection, Realization (structured systems & business analysis, prototyping, design, knowledge transfer, business function & business process modification) & optimization in a complex, Enterprise wide production, fincl & logistic environ., on multi-hardware Unix & Windows NT based systems using Oracle, Informix, SQL Server & BAAN's proprietary database, base. Req: bachelors degree in comp. sci. - math/engr'g/sci./business-commerce or equiv. 1 yr exp in job or 1 yr as software engr/systems analyst. Must have appropriate combination of skills as follows: 2 of A or 2 of B as follows: A)Software: BAAN IV Manufacturing, Distribution, Dynamic Enterprise Modeler, Service, Finance; B) Tools: BAAN IV tools, Safari Report Writer, Windows NT, Unix & Unix Networking tools - TCP/IP, X.25, ISDN; high mobility preferred (multiple positions). 40 hrs/wk; \$56,615-\$75,000/yr. Reply to: Washington Job Center Manager, Millcraft Center, Ste. 150LL, 90 West Chestnut Street, Washington, PA 15301. JO #7056097

Programmer Analyst - SAP Specialist: Structured systems analysis, process engr'g, design, configuration, prototyping, developm't, testing, QA, implementation, integration, maintenance & knowledge transfer of SAP R/2 & SAP R/3 systems for business, fincl, banking, mfg & other commercial application systems in a multi-hardware environ. using centralized or distributed Relational Database Mgmt Systems (RDBMS), Fourth Generation Languages (4GLs) & other GUI (Graphical User Interface) front-end tools. Req: B.S. in comp. sci., sci. or engin'g (or equiv.) & 1 yr exp in job offered or as programmer analyst/systems analyst. Must have appropriate combination of skills as follows: 1 of A & 2 of B; or 2 of A & 1 of B; or 2 of A; or 2 of B. A includes FI, CO, AM, SD, MM, PP, QM, PM, HR, PS, WF, IS, BS; B includes ABAP/4, Screen Painter, Menu Painter, SAP Script, Correction/ Transport, Data Dictionary, Function Modules, User-Exit Routines, SAP Installation. High mobility preferred. (Multiple positions) 40 hrs/wk; \$56,615-\$75,000. Report/submit resume to: Barbara Cole, Greene County Team PA Career Link, 4 West High Street, Waynesburg, PA 15370. JO #2028321.

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Software Engineers (3 openings): Design, develop and implement software systems to determine feasibility of design and directs software testing procedures, programming and documentation. Work involves extensive travel and frequent relocation. Must have one year of experience as a software engineer or computer professional and one year of experience using: 1 of Group A and 1 of Group B and 1 of Group C; OR 1 of A and 2 of B; OR 1 of A and 2 of C as follows: Group A - Windows 3.1, Windows NT, Windows 95, Windows 98, Unix, HP-UX, IRIX, Sun OS; Group B - Visual C++, Visual C, C++, Visual Basic, PowerBuilder; Group C - JAVA, TCP/IP, HTML, MFC, CGI, PERL, ASP, COM/DCOM, Active X, MTS. Bachelor's degree or foreign equivalent in one of several limited fields: Computer Sci/Apps, Eng., Chem., Math or Physics. Salary is \$65,000 per/yr, 40 hrs/wk., 9:00-5:00 p.m. Please submit resumes to: Mr. Tom Dembosky, Mgr., Indiana Job Center, 350 N. Fourth St., Indiana, PA 15701; Job Order No.: 5028036.

Programmer/Analyst (4 openings) (Tallahassee FL area): Programming, testing, analysis and implementation of client customized software using COBOL II, CICS, and DB2 in an IBM mainframe environment. \$80,000/yr. Mon. - Fri. 8am - 5pm REOD: 2 yrs exp in job offered. Send resume to the Bureau of Manpower Program Support, PO Box 10869, Tallahassee, Florida 32302-0869. Job Order #FL 2002495

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Programmer Analyst (Unix Networking/Sys. Admin. & Sys. Prog.): Install, customize & fine tune performance of operating sys. on heterogeneous platforms. Achieve connectivity of workstations using networking technologies. Perform sys. configuration mgmt. for both h/dware & s/tware. Provide user support & network trouble-shooting services. Carry out performance tuning of application packages such as Relational Database Mgmt systems (RDBMS) under Unix operating system. Manage TCP/IP based services such as NFS, NIS, TFTP, TELNET, etc. Perform network mgmt. using SNMP & related tools. Ensure fault tolerant printer services & backup mgmt. procedures. Utilizing knowl. of installation of WAN connectivity w/heterogenous h/dware platforms using routers &/or gateways over leased & dedicated circuits. Using knowl. of internals on operating sys. for patching & coding device drivers & network programg using IP/PPX, TLI, Streams & SOCKETS. Req: Bachelors degree in comp. sci.- math/ engr'g/sci./bus.- commerce (or equiv.) & 1 yr exp in job or as software engineer/systems analyst. Must have appropriate combination of skills as follows: 1 of A & 2 of B or 1 of D; or 1 of A & 2 of B & 2 of C; or 1 of A & 2 of C & 2 of D as follows: A) Operating Sys.: IBM AIX, HP-UX, Sun Solaris, DEC Open VMS/Unix, SCO Unix/ODT, USL Unix SVR4, UnixWare; B) LAN/WAN Connectivity/Networking Protocols: TCP/IP, IPX/SPX, NFS, Bridges, Routers, Gateways, X.25, X.400, ISDN, ATM; C) System/Network Prgrm'g: Perl, Korn, Shell, C Shell, RCP, TLI, Streams, SOCKETS, API & toolkits, DDK, AWK, SED, LEX, YACC; D) Networking techs: Ethernet, Token Ring, FDDI; high mobility preferred (multiple positions). 40 hrs/wk; \$56,615-\$75,000/yr. Report/submit resume to Terry Kinney, Mgr., Armstrong County Job Center, 1270 N. Water St., Box 759, Kittanning, PA 16201. JO #8056345.

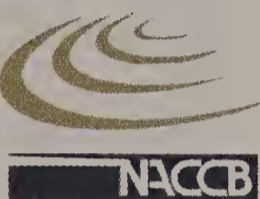
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For consideration, please send your resume to: RCG Information Technology; Attn: National Recruiting, 379 Thornall Street, Edison, NJ 08837; FAX: (732) 744-3583 or Email to: recruit@rcgit.com EOE.

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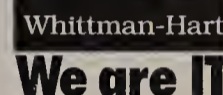
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You will design and develop system interfaces for customer care solutions including client/server systems, connectivity components using API's, messaging and coordination middleware, data exchange, call and data routing. Must have a Bachelor's degree in Computer Science, Math or Engineering, as well as one year experience. The successful candidate will be willing to travel 100% throughout the United States. Salary is \$65,000 per year.

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Will be responsible for systems analysis, design, development, testing and implementation of Clarify software modules for sales force and service force automation for a corporate environment. Testing and implementation of extension programs to Oracle Financials and manufacturing software modules. Developing interface programs for integrating Clarify software suite with Oracle application modules. Must have a Bachelor's degree in Computer Science, Math or Engineering and one year experience; will supervise two people. The successful candidate must be willing to travel 100% throughout the United States. Salary is \$95,000 per year.

To ensure consideration for your position of interest, please indicate the Job Code on your resume. Forward your resume to: Technology Solutions Company, Attn: Human Resources, 205 N. Michigan Ave., Suite 1500, Chicago, IL 60601. No phone inquiries.



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Software Developer wanted by S/ware Dvlpmt Co. in New York City. Must have 2 yrs exp dsngng custom s/ware applics using PERL, SQL & JAVA-SCRIPT. Bach in Comp Sci, Math or Electrical Engg req'd. Respond to: HR Dept, Know-Ware Consulting, Inc, 370 Lexington Ave, Ste 1716, NY, NY 10017.

Systems Analyst wanted by Security Eqpmt Export Co. in Miami, FL. Must have Bach or equiv in Comp Systems Engg & 1 yr exp dsngng, selling & servicing security systems. Respond to: HR Dept, Tronex International Security, Inc, 9590 N.W. 40th St Rd, Miami, FL 33178.

Database Design Analyst sought by Purchase, NY Co. To perform Mathematical Analysis of Surveys. Must have MS in Math, Physics or Statistics. Send resume only to: HR Dept, Sirota Consulting Corp., One Manhattanville Rd., Purchase, NY 10577.

Database Administrator sought by Scranton, PA Co. involved in Leasing & Tech Support of Surgical Laser Systems. Must have BS in Computer/Engg & 2 yrs software exp. Respond to: HR Dept, Excimer Vision Leasing, L.P., 200 Mifflin Ave, Scranton, PA 18503. Attn: M. Fadra

Programmer Analyst sought by IT Co. in Union, NJ. Must have BS or equiv in Comp Sci & 3 yrs exp dsngng, dvlpg & implmtg work flow applics using Lotus Notes 4.6 & its tools and making applics Inter/Intranet capable using JavaScript, HTML & CGI scripts. Respond to: HR Dept, Patel Consultants Corp., 1525 Morris Ave, Union, NJ 07083.

Software Engineer sought by New Jersey-based Mfr & Distributor of Electronic Products for job in Lebanon, TN. Must have MS in Engg & 2 yrs exp dsngng & dvlpg electronic prgm guides, GUIs, digital & analog channel tuning, conditional access for open cable, DSS & 1394 & DSS s/ware support in connection w/hi-tech digital TV products. Respond to: HR Dept, Toshiba America Consumer Products, Inc, 82 Totowa Rd, Wayne, NJ 07470.

Software Engineer (Network Solutions) wanted by Computer Consulting Co. in Plainview, NY. Must have Bach in Comp Sci, Math, Info Sys or Engg & 1 yr computer experience. Respond to: HR Dept, Triton Technology Laboratory Corp., 43 Fairchild Ave, Plainview, NY 11803.

Computer Programmer wanted by Hardwood Flooring Service in Long Island City, NY. Must have Bach in Comp Info Sys & 1 yr exp dvlpg & updating OS & d/base using Java, C++, VB & writing codes for web logics. Respond to: Personnel, Absolute Floors Co, 48-50 37th St, Ste 1-P, LIC, NY 11101.

Computer Technician wanted F/T by Computer Mfg Co. in Hasbrouck Hts, NJ for job in New York City. Must have BS in Comp Sci or Physics & 2 yrs exp in diagnosis & resolution of both h/ware & s/ware problems. Respond to: Personnel, Nettrip Computers, 396 Rte 17 N, Hasbrouck Hts, NJ 07604.

Integration Engineer needed by Boston, MA Co. involved in Dsgn & Dvlpmt of Computerized Speech Systems. Must have Bach or equiv in Electrical Engg or Comp Sci and 2 to 4 yrs exp in speech process technologies & applics using C/C++ for UNIX & Win NT, including computer telephony platforms & applics. Respond by resume to: HR Dept, SpeechWorks International, Inc, 695 Atlantic Ave, 2nd Flr, Boston, MA 02111.

Digital Designer. Professional designer needed by NYC firm for sophisticated computer & schematic design development & technical revisions. Extensive use of 3-D software including Form-Z & Bryce 4. Bachelors' in Computer Science Architecture or related field plus 2 years experience. Please fax resume & cover letter to WASA at 212- 529-9079. Attention G

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Programmer Analyst wanted by Computer Services Co. Mahwah, NJ. Must have 1 yr exp planning, dvlpg, testing & documenting computer s/ware using ORACLE Forms, ORACLE Reports and PL/SQL w/ORACLE d/bases in Windows & UNIX envrmts. Bach in Comp Sci or Systems Mgmt req'd. Apply by resume to: HR Dept, Humanic Design Corporation, 1200 MacArthur Blvd, Mahwah, NJ 07430.

Systems Administrator sought by Retail Sportswear Distributor in Passaic, NJ. Must have Bachelors degree & 1 yr exp supporting & maintaining internal n/work system, n/work infrastructure & comp s/ware systems. Respond to: HR Dept, CDN Sports, Inc, 168 Jefferson St, Passaic, NJ 07055.

Software Developer wanted by S/ware Dvlpmt Co. in New York City. Must have 2 yrs exp dsngng custom s/ware applics using PERL, SQL & JAVA-SCRIPT. Bach in Comp Sci, Math or Electrical Engg req'd. Respond to: HR Dept, Know-Ware Consulting, Inc, 370 Lexington Ave, Ste 1716, NY, NY 10017.

Programmer/Analyst IMI Systems, an international information consulting firm, has an assignment in New York City for an experienced consultant with the following skills: Visual Basic, SQL, Sybase, C/C++. Required: BA Deg. in Mgmt. Inform. Systems/Computer Science, 2yrs. exp. with listed skills. Job #sg99bt. E-mail resumes to: wgartner@imisys.com or mail/fax to IMI Systems, Inc. 1500 Broadway, Suite 1607, New York, NY 10036. Fax: 212-944-1720. Indicate job #. EOE.

Full-time Programmer Analyst to analyze and design software code according to design specifications. Test software programs during and after development for multiple operating systems and provide input to design requirements using object-oriented programming, Windows Development, and Life Cycle methodology. Write new subroutines using C, C++, OOA, OOD, OOP. Interface with project requester and participate in problem solving. Must have a Master's degree in Computer Science or Mathematics. Educational background must have included the above computer skills. Salary \$58,312/yr. Send resume: Laun Hall at IQXPRT, 5500 Interstate North Parkway, Suite 507, Atlanta, Georgia 30328-4662.

Software Engineer. Design, develop and implement application systems in Windows environment. Develop software systems using Powerbuilder, Visual Basic, Sybase, Oracle, on LAN's under MS-Windows operating system. Design and implement software using C, C++, and analyze and determine user requirements. B.S. (comp sci, eng., tel field/equiv) and 5 yrs. exp. 40 hrs/wk. Send resume to: Human Resources, 28 Software, Inc., 44 Wood Avenue, Suite 1, Mansfield, MA 02048.

Applications Consultant. Job location: Burlington, MA. Duties: Convert customer requirements into comprehensive multiplatform distributed solutions using Oracle Express and Visual Basic applications. Design & develop data warehouse solutions using Hyperion's Essbase Application. Create reports & interfaces with production systems using Visual Basic, Hyperion's Essbase application, Oracle Database and MS Excel. Requires: Bach.'s in Comp. or Info. Sci., Eng., Econ. or related field. Coursework must incl. class in computer science. EOE. 40 hrs./wk.; 8:00 a.m. to 5:00 p.m. Salary: \$43,000/yr. Send resume (no calls) to: Diane Tuccito, AnswerThink Consulting Group, 3200 Windy Hill Rd., Suite 800 West, Atlanta, GA 30339. Must have legal auth. to work in U.S.

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Senior Software Engineer Responsible for design and development of manufacturing application components. Product is a productivity enhancing toolkit for building manufacturing networked cell control applications, especially semiconductor fabrication. Must have MS degree in Engineering and 1 year experience in development of network software for manufacturing automation system. Knowledge of C, C++, TCP/IP on UNIX and Windows NT and manufacturing systems especially semiconductor fabrication required. Send resume to: Kori Young, HR, Fastech/Brooks Automation, 15 Elizabeth Drive, Chelmsford, MA 01824.

Software Engineer wanted by New Jersey-based Computer Services Co. for job in Middletown, NJ. Must have Masters in Comp Sci, Comp Engg or Elec. Engg & 1 yr exp analyzing, dsngng & dvlpg comp s/ware using vb & HTML in Windows envrmt & n/working using TCP/IP and file transfer protocols. Respond to: HR Dept, Integrated Solutions, 2124 Highway #35, Holmdel, NJ 07733.

Programmer/Analyst sought by Computer Services Co. in Edison, NJ. Must have Bach in Comp Sci, Comp Engg or Elec. Engg and 1 yr exp planning, dvlpg, testing & documenting comp s/ware using PowerBuilder & VB w/ORACLE & SYBASE d/bases in Windows & UNIX envrmts. Respond to: HR Dept, Horizon Companies, Inc, 5 Lincoln Hwy, Edison, NJ 08820.

Senior S/ware Engineer. Lead, Model, Analyze, dsngng, dvlpg and administer two-tier client/server applications using Oracle. Analyze and model business, industry, and appli specific processes and using Win. GUIs. Dsgng, dvlpg, test, implem code using V++, VB, PB, Oracle 2000. Dsgng & dvlpg reports using Crystal Reports and Oracle Reports. Demonstrated ability to provide database access using ODBC, triggers, stored procedures for Oracle on Win. NT and HP/UX, SUN, HP and SCO. Demonstrated ability to dvlpg Oracle appli on a Win. NT using Oracle 2000, VC++ and MFC. MS in Comp. Sci. related field/equiv. 2 yrs exp. Hrs: 40 hrs/wk. 9:00 a.m. - 5:00p.m. \$70,000/yr Fax 2 resumes to Software Pundits, Inc. 781-273-2811

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Various skills combinations required: Sybase, Powerbuilder, MS-SQL, Oracle, Visual Basic, Visual C++, Java, SAP, Mantis, Supra, People Soft, Unix, Windows NT etc. Apply with two copies of resume to H.R. Department, Mega Infotech, 3849 Amboy Road, Suite # K-2 Staten Island, New York, NY 10308.

SOFTWARE ENGINEER to design, develop, test, implement, maintain and support e-commerce websites, company web sites and business data processing systems using Visual Basic, HTML, Java Script, VB Script, MS Access and PhotoShop on Windows NT platforms. Require: M.S. degree in Computer Science, Computer Information Systems, or a closely related field. Must have a demonstrated ability to perform the stated duties gained through previous work experience / academic coursework and projects. Salary: \$61,400 per year, 8 am to 5 pm, M-F. Send resume to: Debbie Guthrie, Human Resources Director, 1-800-Database, Ltd., 5824 Peachtree Corners East, Suite D, Norcross, GA 30092. Attn: Job YH.

SAP Consultant (multiple openings) to consult with client to define business need or problem relating to production planning application; analyze business processes & document flow, & prepare functional specifications for same; design, develop & customize information structures using SAP (Systems, Applications & Products) module; perform data conversion from existing system to newly defined SAP system; assist in implementation of solutions; & report findings & recommendations to client; Reqs. Master's in Comp. Sci., Systems Analysis, Comp. Info. Systems, Mgmt. Info. Systems, Bus. Admin., Management, Mech. Engg., Indus. Engg., Manuf. Engg., Comp. Engg., Electrical or Electronic Engg., Statistics or Mathematics; \$64K, 40 hrs/wk, 8a-5p. Submit resume of C.V. to The Phila. Job Bank, 444 N. 3rd St. - 3rd Fl., Phila., PA 19123, J.O. #7056192

SOFTWARE ENGINEER to design, develop, test, implement, maintain and support application software systems using SAP, EDI, ADW, Mercator, Oracle, Java, Java Script and Visual Age for Java. Require: M.S. degree in Computer Science/Engineering, or a closely related field, with one year of experience in the job offered or as a Programmer Analyst / Programmer; Extensive paid travel on assignment to various client sites within the U.S. is required. Salary: \$75,000 per year, 8:30 am to 5:30 pm, M-F. Apply by resume to: Roz L. Alford, CEO, A.S.A.P. Co., Inc., 3495 Buford Hwy., Duluth, GA 30097; Attn: Job VG.

Two full-time Systems Analysts to analyze user requirements, procedures, and problems to automate processing or to improve existing computer system. Responsible for designing applications for the company and its clients. Help clients create applications on the Desktop environment and lead a team to develop methodologies. Develop source code using various versions of Clipper Software that has a proprietary database interface. Convert some of the current applications to client server technology using Delphi. Must have a Bachelor's degree in Computer Science or Math or related field or foreign equivalent. Must have two years of experience in the job offered or two years of experience as a Programmer or Programmer Analyst. Salary \$64,000/yr. Send resume to: Kenneth Reeves at Software Research Associates Atlanta, LLC, 70 Mansell Court, Suite 100, Roswell, GA 30076.

Two full-time Systems Analyst Consultants responsible for design and development of software applications for the company and its clients. Assisting clients in state-of-art client server technologies under UNIX and Windows NT environment. Responsible for writing code in Visual Basic and C using the Object linking and embedding technologies (OLE) which is used to transfer data between the source and other external applications. Responsible for design and development of the database interface between the client applications and backend Server database that is running Oracle or Sybase, using Open Database Connectivity (ODBC). Must have a Bachelor's degree in Computer Science or Math or related field or foreign equivalent. Must have two years of experience in the job offered or two years of experience as a Programmer. Salary \$63,000/yr. Send resume to: Kenneth Reeves at Software Research Associates Atlanta, LLC, 70 Mansell Court, Suite 100, Roswell, GA 30076.

PROGRAMMER/ANALYST to analyze, design, develop, test, implement and maintain application software for telecommunication industry using Cold Fusion studio, C, Pro*C, HTML, SQL, PL-SQL, RDBMS, Oracle, Web Server IIS, Cold Fusion application server, Perl and Shell script on UNIX, LAN, Windows NT operating systems; Provide data interfaces to and from other external applications. Require: Bachelor's degree (or equivalent) in Computer Science, Physics, Mathematics, or a closely related field, with two years of experience in the job offered; Three years of college education with an additional three years of experience in the field will be considered equivalent to the Bachelor's degree; Extensive travel on assignment to various client sites within the U.S. is required. Salary: \$60,000/ year; 8 am to 5 pm M-F. Send resume to: Raghavendra Kulkarni, Pro Softnet Corporation, 3235 Satellite Blvd., Bldg. 400, Suite 300, Duluth, GA 30096. Attn: Job PD.

SENIOR SOFTWARE ENGINEER to design, develop, test, implement and maintain business applications for insurance/telecommunication/processing industries using online transaction processing (OLTP) with CICS, DB2, COBOL, Batch processing, MVS, JCL, VSAM, ADW/MVS Key, FileAid, Insync, Endeavor, Interrest, Smartest, Abendaid, QMF, SPUFI, Oracle, Developer 2000, Visual Basic, Java/JDBC Connectivity, C, C++, Java and Easytrieve on UNIX, LAN, Windows, DOS and OS/2 operating systems. Require: M.S. degree in Computer Science, an Engineering discipline, or a closely related field, with two years of experience in the job offered or in the related occupation of Software Engineer. Extensive travel on assignments to various client sites within the U.S. is required. Salary: \$70,000/yr., 8 am to 5 pm, M-F. Send resume to: Raghavendra Kulkarni, President, Pro Softnet Corporation, 3235 Satellite Blvd., Bldg. 400, Suite 300, Duluth, GA 30096; Attn: Job VD.

SENIOR SYSTEMS ANALYST to analyze, design, develop, implement, maintain and support software systems for various business management applications including project management, manufacturing, planning, and inventory control systems using Lotus Notes Domino, LotusScript, Java-Script, HTML, Java, Visual Basic and C/C++; Develop, maintain and audit project and quality management systems using ISO 9000 guidelines; Set up and administer Windows NT and Lotus Notes/ Domino Systems and Networks. Require: Master's degree in Computer Information Systems, Business Administration, Management, or a closely related field; Must have a demonstrated ability to perform stated duties gained through previous work experience / academic coursework and projects; Extensive paid travel on assignments to various client sites within the U.S. is required. Salary: \$53,000 per year, 8:30 am to 5:30 pm, M-F. Apply by resume to: Pishu Harjani, President & CEO, Focus Software Inc., 22 Perimeter Center East, Suite 2205, Atlanta, GA 30346; Attn: Job JS.

Financial Systems Analyst Set up the company's new software development systems, including estimating the number and performance of service necessary to handle requirements. Set up a customized e-mail and Web server network to handle customer inquiries and employee e-mail and Web browsing. Upgrade the company's financial systems, including invoicing, cash management, business planning and government and payroll reporting. Must have at least an MBA degree and one yr. of exp. in above position or one yr. exp. as IS Manager, Fin. Systems Analyst, Financial Manager or rel. w/ability to use Oracle software and other databases and tools. Manager IS, Manager Financial, Foxpro, Cobol, Pascal, and C. 40.0 hr/wk. \$61,652/Yr 8:00 AM - 5:00 PM. Applicants send resume to: Jeff Slosar, Manager, 1940 N. 13th Street, Suite 231, Reading, PA 19604

Full-time Software Engineer responsible for system analysis, design, code, development, testing, debugging, quality assurance, integration, implementation, post implementation support and documentation. Work with medium to complex accounting, inventory, manufacturing, finance and other business application systems using different database systems and 4GLs multi-hardware/multi-software platforms and PC systems, Data Warehousing and Data Mining concepts, OS/400 and UNIX. Must have a Master's degree in Computer Science or foreign degree equivalent. Must have five years of experience in the job offered or five years of experience in a position with same duties. Salary \$60,000-65,000/yr. Send resume to: gkruse@ecsinc.net or Geoffrey Kruse at Enterprises Computing Services, Inc., 8744 Main Street, Suite 101, Woodstock, GA 30188.

Two full-time Senior Software Engineers responsible for high level design, modeling and architecting of a credit card system. Responsible for the design and development of a tool that converts mainframe Statistical Analysis code to Epsilon Query Language using AIX on Scalable Powerparallel/2 (SP/2), PERL and C++. Must have a Master's degree in Computer Science and Engineering or foreign equivalent. Must have four years of experience in the job offered or four years of experience as a Software Engineer. Salary: \$72,000/yr. Send resume to: Kenneth Reeves at Software Research Associates Atlanta, LLC, 70 Mansell Court, Suite 100, Roswell, GA 30076.

Manager Business Systems
You will manage the system administration of UNIX (Solaris, Sun-OS, AIX), NT servers supporting Web Sites and the database administration of development and production Sybase/Oracle servers. Other responsibilities include directing the installation/configuration of hardware/software, overseeing trouble shooting problems, performing upgrades, and handling the backup/restoration of data. You will also manage the Internet administration and supervise a team of systems/database administrators in the planning, analysis, and design of all network infrastructure initiatives. The position of Manger, Systems and Database Administration requires a Master's Degree in Systems Management, Computer Science (or a related field), 3 years experience in the position offered, or as a Unix Systems Administrator. May accept a Bachelor's Degree in Computer Science (or equivalent), 5 years experience in lieu of a Master's Degree, and 3 years experience. As a \$2.7-billion dynamic publisher, we provide a competitive salary, full benefits, and an exciting environment in which to build your career. For consideration, please send resume with salary history/requirements to: Pearson Education, Human Resources, Dept KN/GC, One Lake Street, Upper Saddle River, NJ 07458. Fax: 201-236-3381. For more information, visit us at: www.pearson.com. EOE m/f/d/v

Oracle Applications Sr. Consultant. Job location: Conshohocken, PA. Duties: Analyze, design, develop & implement Oracle based solutions using Oracle Financials, web-based internet develop., Oracle Web DB, Oracle 8 database, Oracle Developer 2000 & Designer 2000. Provide tech. support for interfaces between disparate systems. Perform conversion of data from legacy systems to Oracle 8 database & custom develop. of applications integrated with Oracle applications Web Suite. Requires: M.S. (or foreign equiv.) in Comp., Info. or Mgmt. Sci., Eng. or a related field and 3 yrs. exp. in the job offered or 3 yrs. exp. as a Software Consultant, Software Eng., or Project Leader. Exp., which may have been obtained concurrently, must incl.: 3 yrs. exp. designing, developing & implementing solutions using Oracle Financials & 3 yrs. exp. performing custom development of applications integrated with Oracle Applications Web Suite. EOE. 40 hrs./wk.; 8:00 a.m. to 5:00 p.m. Salary: \$96,000/yr. Send resume (no calls) to: Diane Tuccito, AnswerThink Consulting Group, 3200 Windy Hill Rd., Suite 800 West, Atlanta, GA 30339. Must have legal auth. to work in U.S.

SOFTWARE ENGINEER to provide on-site software solutions using structured systems analysis, design, development, testing, quality assurance, implementation, integration, maintenance, support and conversion of large volume online transaction processing and batch application systems in multi-hardware/multi-software environment over centralized database systems using relational/hierarchical database management systems, third and fourth generation languages (3GLs and 4GLs), CASE tools, Internet application development tools, languages and transaction processing software involving operating systems MVS, VMS, DOS, Windows 95 and Windows NT using MVS application development tools JCL, VSAM, DB2, CICS, SAS, COBOL, Visual Basic, Java, Coldfusion and HTML. Require: B.S. in Computer Science/Engineering and five years experience in the job offered or as Programmer/Systems/Analyst. 40% travel required to client sites. Salary: \$62,000 per year, 7:30 am to 4:30 pm, M-F. Mail resume to: President, YASH Technologies, Inc., 2100 Parklake Drive, NE, Suite F, Atlanta, GA 30345-2167.

Consultant/Software Engineer to serve as member of Architectural Service Group, playing important role in planning and implementing the company's technology infrastructure. Specifically, design, develop, and maintain client/server application systems including, development of technical policies and procedures, project management, and providing technical leadership. Duties include technical architecture design, defining development environment, selecting development tools, analyzing specifications, interfacing with external organizations, and leading research efforts. Requires Master of Science Degree in Computer Science and three (3) years experience in job offered or three (3) years experience developing client/server applications OR Bachelor of Science Degree in Computer Science and five (5) years experience in job offered or five (5) years experience developing client/server applications OR ten (10) years experience developing client/server applications. Candidate must also possess demonstrated expertise in analysis, design and development of client/server based object-oriented applications; demonstrated expertise in analysis, design and development of distributed data warehousing applications using ORACLE, SYBASE or INFORMIX; and demonstrated expertise in design and development of 3-tier client/server applications using MIDDLEWARE tools (TUXEDO OR CORBA). Salary: \$85,000/yr; Mon-Fri, 9:00AM-5:00PM. Send two (2) copies of resume to RI Department of Labor and Training, ATTN: T. Salabert, 101 Friendship Street, Providence, RI 02903-3740. Refer to ID#98-169. EOE. Applicants must be U.S. workers eligible to accept employment in the United States on a full-time basis.

Consultant Software Engineer/Developer to develop financial applications in Windows NT, UNIX, Client/Server, and Internet environments. Design, implement and maintain strategic investments planning systems, transaction systems that integrate client/server systems, internet technologies, and legacy systems. Confer with business analysts and users to develop and refine business requirements, interpret requirements into system specifications, and develop technical solutions to resolve business problems. Requires Bachelor of Science Degree in Computer Science, Electronics, or Communications Engineering and five (5) years experience in job offered or five (5) years experience developing applications in a UNIX or WINDOWS environment OR Master of Science Degree in Computer Science, Electronics, or Communications Engineering and three (3) years experience in job offered or three (3) years experience developing applications in a UNIX or WINDOWS environment. Candidate must also possess demonstrated expertise developing distributed and client/server systems; demonstrated expertise performing business modeling using object-oriented technologies; demonstrated expertise developing GUI using Visual C++ or JAVA; and demonstrated expertise developing relational database access applications using SYBASE or ORACLE. Salary: \$79,517/yr; Mon-Fri, 9:00AM-5:00PM. Send two (2) copies of resume to RI Department of Labor and Training, ATTN: T. Salabert, 101 Friendship Street, Providence, RI 02903-3740. Refer to ID#98-155. Applicants must be U.S. workers eligible to accept employment in the United States on a full-time basis.

ICE DEVELOPER (PROGRAMMER) to test, debug, modify and correct components of various software systems which will entail planning, developing and documenting computer testing programs using C++, Visual C++, and various computer software and system testing tools. Require: B.S. degree in Computer Science, or a closely related field, with 2 years of experience in the job offered. Salary: \$40,865 per year, 9:00 am to 6:00 pm, M-F. Apply by resume to: Autavea L. Dabney, HR Specialist, Paysys International, Inc., One Meca Way Norcross, GA 30093; Attn: Job RM.

Programmer/Analysts to plan, develop, test, and document computer programs, applying knowledge of programming techniques and computer systems, including those for both PCs and mainframes. Evaluate user requests for new or modified programs to determine feasibility and cost and time required, compatibility with current systems and computer capabilities. Formulate plan outlining steps required to develop program; convert project specs into sequence of detailed instructions and logical steps for coding into language processable by computer, applying knowledge of computer programming techniques and computer languages. Analyze, review and alter programs to increase operating efficiency or adapt to new requirements. Bachelor's in Computer Sc. or Engineering plus 2 yr. exp. in job offered or 2 yr. exp. as systems analyst or software engineer req. Salary: \$55,230/yr. Job site: various unanticipated sites throughout the U.S. Employer location: Pittsburgh. Send this ad and your resume to Job # 2028319, c/o Duane Brentzel, Office of Employment Security, 599 Sells Lane, Greensburg, PA 15601.

SR. SOFTWARE ENGINEER TELECOMMUNICATIONS

You will maintain telecommunications network interface unit software and device driver on an OS/2 operating system to deal with real-time connection with ISDN BRI, PRI, T1, E1 and ATM network. Provide technical support and troubleshooting for proprietary videosever product. Use protocol analyzer to analyze incoming and outgoing data between videoconference server and telecommunication switching network. Maintain system management software and source control library. Develop code in C++ in Unix and multi-processing/multi-tasking program environment. Use communication protocols: ATM/Traffic Management and TCP/IP. Knowledge of C, C++ and TCP/IP. Master of Science in Electrical Engineering, Computer Science or Computer Engineering and 1 year of experience, or 1 year of experience as a Software Engineer-Telecommunications. Monday-Friday, 9-5, 40 hrs/wk., \$71,052.80 per yr. Send 2 resumes to Case #19982072, P.O. Box 8968, Boston, MA 02114. EOE. All registered trademarks are property of their respective companies.

Programmer needed to design, code, test, implement and maintain systems for medical software development and sales. 40 hours per week. Salary \$36,460 per year. Must have B.S. Degree in Business Information Systems, Computer Science, or related field. Must possess knowledge of requirements definition, designing, coding, testing, implementation and maintenance. Must possess strong technical, analytical and communication skills. Must possess experience with automated testing tools, Microsoft Access and general financial, accounting and information systems. Send resumes to Pat Redington, Job Order No.: 3060794, Department of Workforce Services, Employment & Development Division, 140 East 300 South, Salt Lake City, UT 84111. EOE

Software Engineer: Responsible for technical leadership, architectural design, development, testing, and documentation of computer software systems. Work in E-commerce and telecommunication industry. Perform Object oriented design and analysis using C/C++/JAVA testing under UNIX & WINDOWS. Req. Master's in Computer Science plus minimum of 1 yr exp. with Object-Oriented design & analysis using C/C++, and Java under Unix. Sal. \$64-74k/yr. Apply to: Recruiting Manager, ASI Services Corp., 1475 Peachtree Street, N.E., Suite 210, Atlanta, GA 30309, or fax: (404) 888-8349.

SOFTWARE ENGINEER

Software engineer to design, develop and test computer programs for business applications; analyze software requirements to determine feasibility of design; direct software system testing procedures using expertise in DB2, CICS, VS COBOL II and Expeditor. Requirements: Bachelor's Degree or equivalent in Computer Science or related field and two years experience as a software engineer or computer programmer, knowledge of DB2, CICS, VS COBOL II and Expeditor. Salary: \$57,000/year. Working Conditions: 8:00 A.M. to 5:00 P.M., 40 hours/week, involves extensive travel and frequent relocation. Apply: Ms. Charlene Cogley, Beaver County Job Center, 120 Merchant Street, Ambridge, PA 15003, Job No. 8056350.

Software Engineers to design, develop, implement, and maintain complex engineering, business, accounting and management information applications and systems. Act as lead analyst in the development, implementation and maintenance of computer systems, including networked and client-server applications, requiring knowledge and experience across a variety of computing platforms, data bases and computer languages. Coordinate and instruct programmers and analysts assigned to his projects. Prepare feasibility studies of potential systems, configuration of components, interactive applications, and complex application specifications. Bachelor's in Computer Science or Engineering plus five yr. exp. in job offered or five yr exp as Programmer/Analyst or Systems Analyst, or Master's in Computer Science or Elec. Engineering - with the ability to perform the essential job duties, req. Salary: \$58,000/yr. Job site: various unanticipated sites throughout the U.S. Employer location - Pittsburgh. Send this ad and your resume to Job # 9102376, c/o Tom Dembosky, Indiana Job Center, 350 N. Fourth St., Indiana, PA 15701.

SOFTWARE ENGINEER

Software engineer to design, develop and test computer programs for business applications; analyze software requirements to determine feasibility of design; direct software system testing procedures using expertise in CGI, Java, JavaScript and Oracle. Requirements: Master's Degree or equivalent in Computer Science or related field and two years experience as a software engineer or computer programmer, knowledge of CGI, Java, JavaScript and Oracle. Salary: \$83,200/year. Working Conditions: 8:00 A.M. to 5:00 P.M., 40 hours/week, involves extensive travel and frequent relocation. Apply: Mr. Tom Rusnack, Charleroi Job Center, 10 Paluso Drive, PO Box 210, Charleroi, PA 15022, Job No. 9102398.

Senior UNIX Systems Administrator. NYC. Requires a Bachelor's degree in computer science and 4 yrs. exp. in the job offered or in the engineering and architecture of UNIX systems. All stated exp. must have involved eng. and administration of SUN Microsystems hardware and systems software. Engage in the engineering and architecture of UNIX systems. Engineer and administer SUN Microsystems hardware and systems software. Engage in the support of all UNIX servers, including those that support Sybase, Web/Internet/Intranet services and those that support production systems and development groups. Provide in-depth analysis of cross-platform problems and resolve related issues. Ensure efficient operation of all UNIX services and perform system monitoring and capacity planning as needed. Contribute regularly to the documentation of all UNIX security policies, configuration changes, upgrade issues and application support strategies. Document and maintain data procedures and any written reports in support of all components of the state-of-the-art UNIX environment. 40 hrs/wk 9:00 - 5:00. Send resume to: Alliance Capital Management L.P., Human Resources, 1345 Avenue of the Americas, New York, NY 10105.

Hardware Engineers to design, develop & implement embedded real-time OS for microcontrollers using C, C++, Visual Basic, assembly langs., etc., ASIC and PLD using VHDL on multiple platforms; verify electrical & timings specs. using ICE, OSC., and logic analyzers; DSP chips & Image Processing algorithms; communications using single & dual wire serial protocols, parallel interface; perf. other rel. duties as assigned. Sal @ \$60,000/yr., O/T @ \$42/hr.; Req's: B.S. in Elec. Eng., & 6 mos. rel. exp.; travel. Resumes to Jennifer Hansson, Aerotek/Maxim Group, Inc., 7301 Parkway Dr., Hanover, MD 21076. ID Ref. #SHAH-99-72808.

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- 7:45am **Continental Breakfast & Conference Registration**
- 8:30am **Cutting Edge Tools for the Internet Recruiter** Dr. Bret Hollander, NETRECRUITER
- 10:00am **Coffee Break**
- 10:45am **Sourcing Techniques** Cathy Peterson, Romac International
- 12:00pm **Luncheon Keynote: Perception is Not Just Everything, It's Everywhere** Frank Cutitta, IDG Global Solutions
- 1:30pm **Silent Impact: The Basic Tenets of Staffing & Bottom Line Effects** Dan Hanyzewski, Mastech Corp.
- 2:45pm **Coffee Break**
- 3:30pm **The Role of the Recruiter in Retaining Talent** Barbara Mitchell, The Millennium Group International
- 5:00pm **Program ends**

Selected sessions include:



Perception is Not Just Everything, it's Everywhere

FRANK CUTITTA, IDG GLOBAL SOLUTIONS

Like it or not, the web puts your company in Boston and Bosnia, San Jose and San Tropez. Closer to home, multicultural considerations are as far as the next hemisphere and as close as the next state. With a focus on the "why" instead of the "how," this entertaining session shows you why every company must consider the varied cross cultural perspectives of their web site visitors.



Silent Impact: The Basic Tenets of Staffing & Bottom Line Effects

DAN HANYZEWSKI, MASTECH CORP.

The recruitment organization has a silent but profound impact on the success, or lack thereof, on a corporation's financial performance. So how does the staffing department- a cost center- drive a P&L mentality? Find out more in this key session.



Cutting Edge Tools for the Internet Recruiter

DR. BRET HOLLANDER, NETRECRUITER

Recruiting changes every second on the Internet. This practical session from a leading internet recruiting professional will deliver the latest in electronic recruiting tools.



The Recruiter's Role in Retaining Talent

BARBARA MITCHELL, THE MILLENNIUM GROUP INTERNATIONAL

Today's I.T. recruiter can impact retention. Every recruiter should ask themselves if the messages sent via the organization's website, annual report and other marketing materials fits with the message conveyed in the recruitment process.



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CATHY PETERSON, ROMAC INTERNATIONAL

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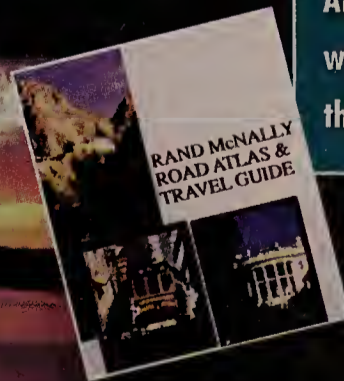
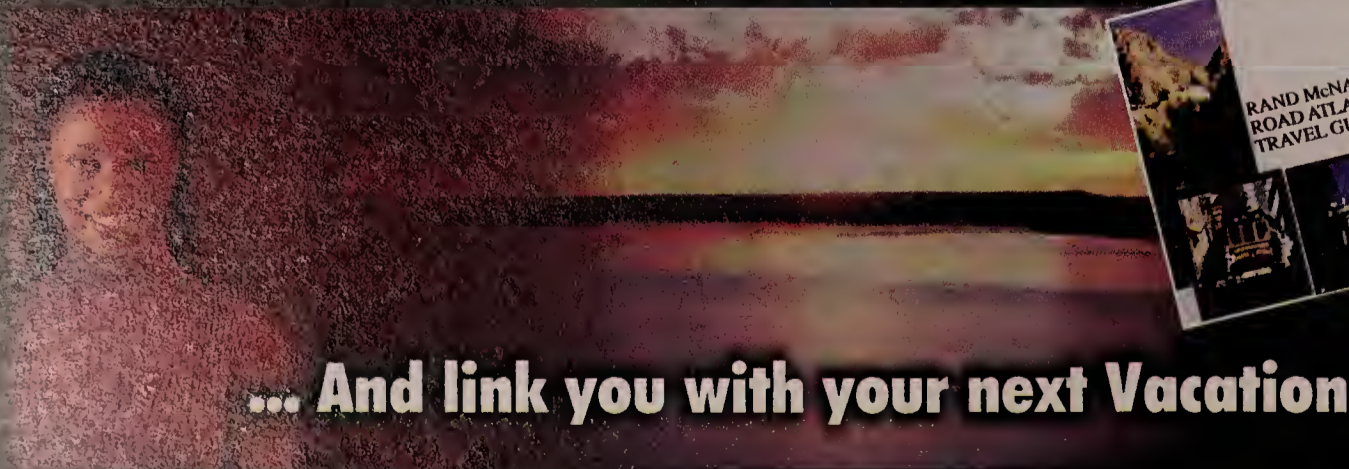
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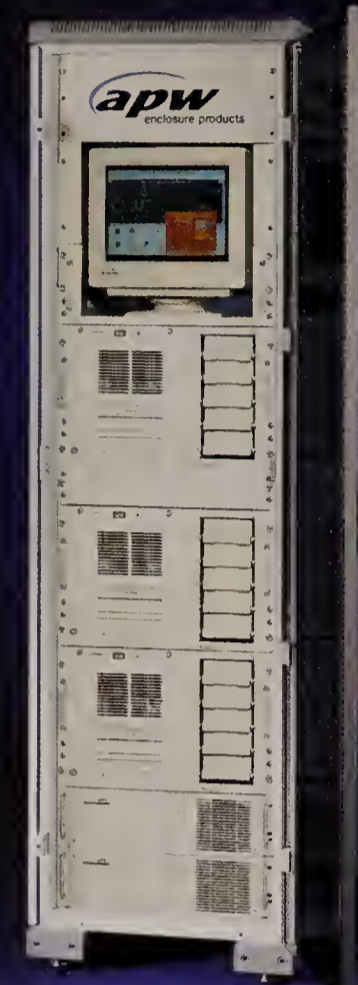
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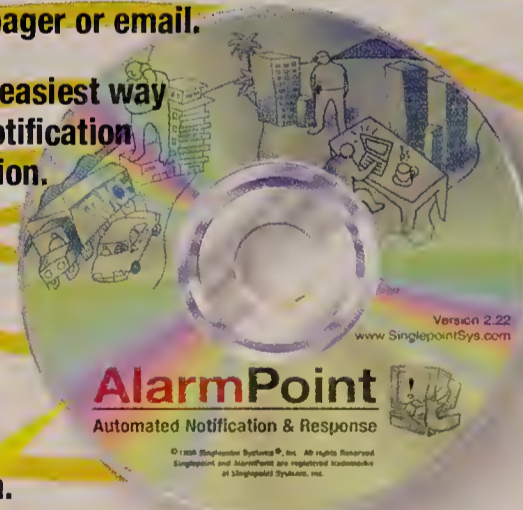
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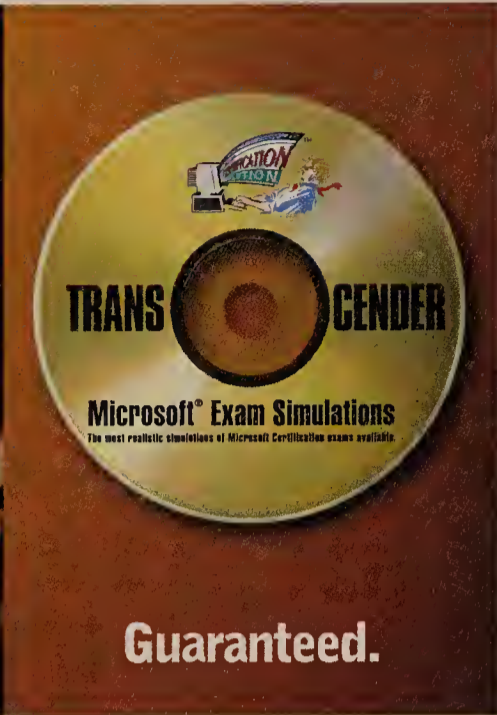
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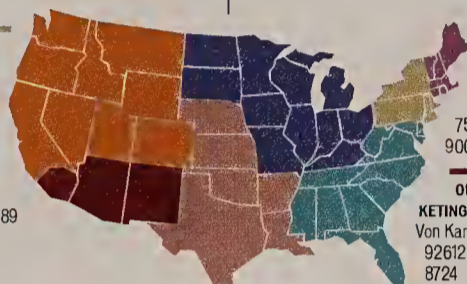
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Analysts: Not All Tech Stocks Swoon

Intel leads a downturn; network-centric stocks show more promise

BY ROBIN ROBINSON

LAST WEEK'S DROP in value for technology stocks isn't a sign of darker times for the industry, at least according to several technology analysts. In fact, they say, this is just part of a cyclical rise and fall that should help investors remember to think long term.

Intel Corp. (Nasdaq:INTC) lost 6% of its price per share, closing at 72 1/8 on Oct. 13, the day after the chip maker released disappointing third-quarter earnings. The Nasdaq Stock Market Inc. composite index plunged 71.16, or about 2.5%, to close at 2801.27.

The trigger seemed to be Intel, which fell 4 9/16, but every technology sector was down, including technology blue chips (down 2.6%), software (off 2.8%), Internet (off 3.1%), chips (off 3.1%) and computers and peripherals (down 2.7%).

However, some Nasdaq companies didn't fare as badly, among them Concentric Network Corp. (Nasdaq:CNCX), which closed at 24 1/8, up 3 11/16, and e-commerce services vendor ViaLink Co. (Nas-

daq:IQIQ), which closed at 28 3/4, up 4 3/4. And on the New York Stock Exchange, Newbridge Networks Corp. (NYSE:NN) closed at 23, up 1/2.

"We're seeing a rotation of capital out of semiconductors and into the Internet," says Frank Drazka, managing director and head of technology investment banking at New York-based Paine Webber Group Inc. "These are typical three- to four-year boom-and-bust cycles within a sector."



"I'd argue that you're seeing certain technology sectors having upsides," Drazka adds. Yahoo Inc. (Nasdaq:YHOO),

which was down 6 5/16 to 167 9/16, "handily beat our quarterly expectations, for example. But three years from now, people will be cycling somewhere else," he says. MCI WorldCom Inc. (Nasdaq:WCOM) closed at 74 7/8, down 3, and Verio Inc. (Nasdaq:VRIO) closed at 29 3/4, down 1 1/4.

I'd argue that you're seeing certain technology sectors having upsides.

FRANK DRAZKA, MANAGING DIRECTOR, PAINE WEBBER GROUP INC.

Charlie Glavin, vice president and senior equity analyst at Credit Suisse First Boston Corp. in Palo Alto, Calif., thinks the technology sector will spin strongly for a lot longer.

"One of the sectors we cover very aggressively — the communications [integrated circuit] market — that's a bigger infrastructure play, a five- to 20-year megacycle overall," Glavin says. "You really haven't seen an aggressive buildout yet."

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EXCH	52-WEEK RANGE		OCT. 15 2 PM	WK NET CHANGE	WK PCT CHANGE
ASWX	30.00 12.50	Active Software (H)	26.75	0.25	0.9
ADBE	122.00 31.87	Adobe Systems Inc. (H)	119.63	5.50	4.8
ARBA	198.62 61.00	Ariba Inc.	183.13	-12.50	-7.1
AZPN	19.87 7.75	Aspen Technology Inc.	8.94	-0.31	-3.4
ADSK	49.43 19.75	Autodesk Inc. (L)	20.25	-0.25	-1.2
AVID	34.25 12.00	Avid Technology	15.00	1.25	9.1
BMCJ	73.12 30.00	BMC Software Inc.	56.50	-3.63	-6.0
BOBJ	64.25 9.68	Business Objects S.A. (H)	55.75	-6.63	-10.6
CON	36.00 9.12	Cadence Design Systems	14.69	0.44	3.1
CBTS	30.50 6.68	CBT Group Plc.	27.13	-1.44	-5.0
CHKP	97.62 15.37	Checkpoint Software Tech. Ltd.	85.13	-1.25	-1.4
CTXS	69.93 26.50	Citrix Systems Inc.	81.63	-3.13	-4.8
COGN	28.12 16.06	Cognos Inc.	25.50	-0.56	-2.2
CA	63.43 32.12	Computer Assoc. International Inc.	52.75	-5.44	-9.3
CPWR	40.00 16.37	Compuware Corp.	26.94	0.44	1.7
OCIM	54.12 9.37	Occomium	28.50	1.38	5.1
EFII	64.87 17.50	Electronics For Imaging	47.94	-6.06	-11.2
HNSC	41.50 13.75	Hnc Software	37.88	2.13	5.3
HYSL	36.12 9.87	Hyperion Solutions Corp.	22.69	3.69	19.4
IDXC	50.75 12.43	IDX Systems	16.75	-1.25	-6.9
INFA	6.00 19.00	Informatica Corp.	66.00	8.38	14.5
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INTU	37.00 13.12	Intuit	25.31	-1.13	-4.3
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MANU	17.37 5.25	Manugistics Group Inc.	9.69	0.44	4.7
MENT	15.06 6.62	Mentor Graphics	8.69	-0.63	-5.8
MSFT	100.75 47.93	Microsoft Corp.	88.81	-5.44	-5.8
NETA	67.68 10.06	Network Associates	17.75	-0.25	-1.4
GMH	69.37 30.50	Network General (H)	67.00	1.88	2.9
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PSFT	26.62 11.50	PeopleSoft Inc.	14.88	-2.13	-12.5
PIXR	53.75 33.00	Pixar	37.38	-4.00	-9.7
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RHAT	135.25 40.00	Red Hat Inc.	83.19	-4.50	-5.1
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SBC	59.93 41.62	SBC Communications	50.00	-2.90	-4.8
FON	68.18 31.87	Sprint Corp. (H)	64.50	-2.50	-3.7
TOS	107.00 32.50	Telephone and Data Systems (H)	103.94	12.06	13.1
TNI	46.56 12.00	Transation Network Services	39.13	-2.31	-5.6
USW	66.00 51.50	US West	58.13	-1.50	-2.5
VIA	49.62 28.43	Viacom	41.50	-3.25	-7.3
WCII	64.43 13.50	Winstar Communications Inc.	40.38	-4.50	-10.0
WCOM	96.75 45.81	MCI Worldcom Inc.	73.44	-3.56	-4.6

SERVICES OFF -2.2%

ACXM	31.25 15.87	Axiom Corp.	20.00	0.31	1.6
ACS	53.00 27.25	Affiliated Computer Svcs	35.94	-0.31	-0.9
AMSY	40.25 21.68	American Mgt. Systems	21.75	-1.38	-5.9
AVO	46.87 35.31	Automatic Data Processing	45.00	0.06	0.1
BSYS	60.87 38.56	Bsys Group Inc.	43.00	-0.63	-1.4
CATP	32.25 10.62	Cambridge Technology Ptrns	13.00	0.25	2.0
CEN	40.50 18.00	Ceridian	20.06	-0.19	-0.9
CBR	29.56 13.75	Ciber Inc.	14.56	-0.38	-2.5
COD	30.87 10.75	Comdisco	18.38	-2.00	-9.8
CHRZ	30.12 9.25	Computer Horizons Corp.	12.50	0.13	1.0
CSC	74.37 48.75	Computer Sciences	61.19	-4.56	-6.9
OST	70.25 40.25	Dst Systems Inc.	52.94	-3.25	-5.8
EDS	67.37 33.31	Electronic Data Systems	60.88	-0.88	-1.7
FOC	51.50 20.81	First Data Group	41.50	-5.75	-12.2
FISV	40.75 25.25	Fiserv	26.63	0.06	0.2
IT	25.75 14.25	Gartner Group	14.44	-3.56	-19.8
KEA	43.62 17.25	Keane	21.00	-0.63	-2.9
NDC	55.25 22.93	National Data (L)	23.56	-2.50	-9.6
PAYX	37.37 23.56	Paychex Inc. (H)	35.88	-0.06	-0.2
PER	85.75 16.50	Perot Systems Corp. (L)	16.88	-1.44	-7.8
REGI	14.50 3.68	Renaissance Worldwide	3.88	0.06	1.6
REY	25.31 17.00	Reynolds & Reynolds	19.31	-0.63	-3.1
SFE	120.00 17.12	Safegard Scientifics	75.89	-1.56	-2.0
SAPF	108.75 29.25	Sapient Corp.	88.38	2.81	3.3
SMS	73.50 40.25	Shared Medical Systems	46.06	2.19	5.0
SDS	41.93 16.87	Sungard Data Systems (L)	19.13	0.88	4.8
SYNT	19.75 7.00	Syntel Inc.	8.13	-0.69	-7.8
TECO	47.25 14.50	Tech Data	23.13	-1.25	-5.1
TENF	39.50 17.00	TenFold Corp. (L)	24.31	5.88	31.9
TSS	26.25 14.12	Total System Services Inc.	16.63	-1.38	-7.6
TSAI	51.00 24.18	Transaction Sys. Architects	25.56	-1.44	-5.3

NETWORK OFF -0.4%

CDMS	51.12 20.00	3Com Corp.	29.94	0.69	2.4
ADCT	53.62 17.50	AOC Telecommunications Inc.	44.56	1.75	4.1
ANTC	60.25 11.50	Antec (H)	59.13	4.75	8.7
BNNY	19.37 2.87	Banyan Systems Inc.	9.19	0.00	0.0
CS	19.93 7.18	Cabletron Systems	16.06	-1.19	-6.9
CNEBF	9.75 3.93	Call-Net Enterprises	5.56	-0.56	-9.2
CSCD	73.56 25.12	Cisco Systems Inc.	68.38	2.38	3.4
ECIL	45.00 20.00	ECI Telecom	28.81	4.94	20.7
ENTU	43.08 9.00	Entrust Technologies Inc.	23.75	5.25	28.4
HRS	40.62 23.62	Harris Corp.	25.31	-1.00	-3.8
GMH	69.37 30.50	Hughes Electronics/GM (H)	67.00	1.88	2.9

SEMICONDUCTORS, CHIPS & EQUIPMENT UP 0.9%

ERICY	35.25 19.25	LM Ericsson	32.50	-1.25	-3.7
JNPR	251.75 90.12	Juniper Networks Inc. (H)	219.38	10.50	5.0
LU	79.75 32.00	Lucent Technologies	80.25	-3.38	-5.3
MAO6F	5.18 1.93	Madge Networks	2.09	-0.03	-1.5
NCOI	8.50 4.25	Network Computing Dev.	4.44	-0.31	-6.8
NWK	13.68 7.31	Network Equipment Tech.			

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E-Mail Monitors

land, Wash.-based Content Technologies Inc. to scan the content of e-mail on the company network. "Probably 30% of the e-mails going through our servers were not work-related," said LePage — an infraction of the company's

e-mail usage policy.

LePage said most of the problem was with joke mail, but there were also some inappropriate e-mail attachments.

The Information Protection unit at 20th Century Fox, a subsidiary of News Corp. in Los Angeles, has installed monitoring software from Burlington, Mass.-based Elron Software Inc. The main concern is to make sure valuable movie

ideas don't leave the company, said Jeff Uslan, manager of information protection. But he said he feels he should also protect employees from receiving hate mail and other unwanted messages.

The rising concern about what gets sent over e-mail systems was spurred by several high-profile court cases in which e-mail turned up as evidence. Most of these court cases "could have been prevented if content monitoring had been in place," said Michael Overly, an attorney at Foley & Lardner in Los Angeles.

"We are seeing an increase in the use of content-monitoring software," said Joan Feldman, president of Computer Forensics Inc. in Seattle. Her company gets called in when one party in litigation is asked to produce e-mail.

Feldman recommended a two-pronged approach: A company should know what's sent over its e-mail system and

enforce length restrictions on messages.

Most e-mail monitoring software works by scanning messages for keywords. Suspect messages are either blocked, or a copy is sent to a reviewer. But the majority of the companies surveyed check e-mail only when an irregularity has been reported. And 35% do random checks. Those are two approaches that Overly called "incredibly ineffective."

As content-monitoring software becomes more widely available, Overly said companies could even be found negligent in court for not using it.

At American Fast Freight, a year after putting monitoring software in place, the software is now capturing only two or three inappropriate e-mails per week from the company's 330 employees — requiring only a quick once-per-week check, LePage said.

Although the monitoring software is fairly processor-in-

Continued from page 1

Merger

sure to lower rates and costs," said Ralph Loretta, a utilities industry consultant at AMS Corp. in Fairfax, Va. "Will there be layoffs? Absolutely," Loretta said.

Yet at the same time, the systems integration work that lies ahead for the combined entity is huge. Both Consolidated Edison Company of New York Inc. and Northeast Utilities have an installed base of primarily homegrown, mainframe-based systems for back-office accounting and finance operations. They also use a wide variety of packaged software in individual departments, such as human resources. Both companies use Passport, an enterprise resource planning package from Indus International Inc. in San Francisco, and a human resources application from Tesseract Corp., also in San Francisco.

Perhaps most critical is that they use two different customer information systems, which must be patched together or replaced, to track the newly combined company's 6.9 million gas and electric customers throughout New York and New England.

"Most of their operational systems are things that both companies developed. There may not be direct compatibilities," said Brad Holcombe, a consultant in Andersen Consulting's utilities group in St. Petersburg, Fla.

"There will be tons of integration work," said George Millerd, an information tech-

JUST THE FACTS

The Deal

The combined ConEd and Northeast Utilities:

Headquarters: New York

CEO: Eugene R. McGrath (ConEd's current CEO)

Customers: 5.5M electric, 1.4M gas

Locations: Will operate in New York, New Hampshire, New Jersey, Massachusetts, Rhode Island, Pennsylvania and Connecticut

nology director at Northeast Utilities in Berlin, Conn.

But just who will complete the work remains an unanswered question for now, said Millerd, who oversees the company's enterprise applications and IT infrastructure.

"Literally 99% of the people in IT just found out yesterday that ConEd's acquiring us," Millerd said Thursday. "The only thing we were basically told is that our strategic intent and strategic direction are very compatible."

Northeast Utilities employs 560 workers in IT and has an annual IT budget of about \$100 million, Millerd said.

ConEd didn't return calls made last week.

On the plus side, the two companies' IT groups are culturally well matched, which should help the transition to a single IT organization, said C.D. Hobbs, an analyst at Stamford, Conn.-based Meta Group Inc.'s energy and utilities practice.

"They're in the same part of the country, and currently, Northeast provides some IT support on a contract basis in power plants that ConEd has acquired," Hobbs said. ▀

Continued from page 1

Code Quality

biggest companies.

But in interviews with *Computerworld*, IT executives and other analysts had mixed opinions about whether year 2000 projects will break up corporate software quality assurance teams or ultimately degrade the integrity of future software development efforts, as Meta Group's survey suggests.

Capers Jones, president of Software Productivity Research Inc. in Burlington, Mass., is clearly on the pessimistic side of the fence, even without any Y2K-induced reshufflings of staff. The current state of software quality "is very troubling," he said, both for software vendors and user companies that develop their own applications.

Companies that are cutting back on their software quality assurance efforts, said Jones, "are suspect in terms of their actual knowledge of software economics."

The Meta Group research finds that legacy system devel-

opments that rely on "waterfall" programming techniques such as Cobol will be harder hit than object-oriented and newer languages that rely on newer, more sophisticated development approaches. Still, e-commerce applications may also be vulnerable because "there will be less documentation and testing" during application development cycles, said Malcolm Slovin, a Meta Group analyst.

Several IT executives and analysts disagreed with Meta Group's conclusions. If companies experience any software quality degradation going forward, "it's more about the pace of [e-commerce demands and] software innovations that companies have to embrace," said John McKinley, chief technology officer at Merrill Lynch & Co. in New York.

"If anything, I think most [quality assurance] specialists who worked on year 2000 projects will take that experience under their belts and apply it positively" to future development efforts, added John Burns, vice president of projects at Canadian Imperial Bank of Commerce in Toronto.

Why Check?

What are the top two reasons you would monitor employee e-mail?

57% Potential legal liability from information contained in e-mail

51% Potential leaking of corporate secrets

47% Use of e-mail for racial or sexual harassment

19% Complying with official regulations*

9% Personal (nonbusiness) use of e-mail

* Such as SEC regulations on insider information

Base: Survey of 75 IT managers at companies with 500 or more employees; two responses allowed

SOURCE: COMPUTERWORLD IT INTELLIGENCE UNIT, FRAMINGHAM, MASS.

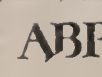
tensive and can take several months to fine-tune, LePage said, "I'm very happy with the solution we've come up with." ▀

In addition, as companies such as Monsanto Co. rely more on packaged commercial software and less on in-house development, "there's more of an emphasis on systems integration and less on application development," said John Ogens, year 2000 project director at the St. Louis-based maker of agricultural and chemical products.

Isolated Events

Research at Meta Group's crosstown rival Gartner Group Inc. has found that year 2000 projects have had only a negligible impact on software quality assurance activities. The incidences "have been very few and very isolated," said Lou Marcoccio, head of Gartner's year 2000 research.

Nonetheless, some industry veterans said they believe Meta Group may be on to something. "Anytime you have a major systems implementation, you're going to have exposure" in other areas, said Dick Arns, executive director at Chicago Research & Planning Group, a Chicago-based user group of CIOs and corporate technology officers. ▀



FRANK HAYES/FRANKLY SPEAKING

Little by little

IT'S A LITTLE THING, using the Web to check in for your airline flight. You'll get your seat assignment confirmed before you leave for the airport, but you'll still have to stand in line to check baggage, and you'll still have to flash a photo ID before they'll let you on the plane. Hardly seems like it's a big enough improvement to be worth an IT project, does it?

But when Alaska Airlines starts allowing passengers to check in via the Internet next month, the airline won't have to worry about that little question. It'll already know.

How? Well, Alaska Air's IT developers know they can build on this particular project's technology, so they figure it's worth it just as a little investment in infrastructure.

And Alaska Air's management has bought in to the idea of high-profile technology for customers and pronounced it worth every nickel if it just makes customers a little more satisfied.

Maybe most important, a batch of customers have already used Alaska Air's Web check-in as part of a pilot project. Those customers like it a lot — they say it's a slick little system, even if it only saves them a little time.

But little by little can add up to some big business changes. And that may be exactly the right approach for IT.

The Web check-in works like this: A passenger with an electronic ticket logs on to Alaska Air's Web site the day of the flight, keys in a confirmation number, gives the right answers to those FAA security questions about luggage and then prints out a bar-coded boarding pass. At the airport, the gate agent swipes the pass with a bar-code reader, checks photo ID and lets the passenger board.

Sure, a big part of what makes this easy to cost-justify is that it really is a *little* IT project. Alaska Air isn't reinventing passenger check-in. The airline already has hundreds of airport self-service kiosks that let passengers get their boarding passes. Online check-in is just that system, but Web-enabled.

And the kiosks themselves use software that's a reworked version of the software Alaska Air ticket and gate agents use to check passengers in — another relatively little change.

More little changes are coming down the line. Alaska Air has scanned in the photos of some frequent fliers, so eventually swiping that

boarding-pass bar code will bring up the passenger's picture on a gate agent's screen. No more photo ID required — another little time-saver. And in Anchorage, the airline is testing check-it-yourself baggage, based on its self-service check-in system — one more little improvement.

Eventually, all these little add-ons, changes and improvements could shave minutes or even hours, not just seconds, off that trip through the airport.

Which ought to raise one obvious little question: Why do we still think we need to build big IT projects to have a big impact on the business?

Little projects cost less. They get done faster. They succeed more often. If they fail (as some of Alaska Air's airport-automation efforts have) you can back out a lot more gracefully — and you can afford a few failures, because the risk of each project is lower.

It's not always possible to break the giant, unwieldy projects we usually dream up into modular, manageable miniprojects. And it's not often easy. Politics and budget-envy get in the way. So does the extra planning required to make sure each little project will create its own business results and still serve as part of a foundation for more new work.

But considering the sky-high failure rates of big IT projects, maybe it's time to quit searching

for the next big thing we can do with IT to transform how we do business.

Maybe we should be looking for the next little thing. ▀

Hayes, Computerworld's staff columnist, has covered IT for 20 years. His e-mail address is frank_hayes@computerworld.com.

*Little by little
can add up
to some big
business
changes.*



SHARK TANK

BIG MIDWESTERN manufacturer hires big consulting company. Goal: Evaluate a major ERP suite. Three months and more than 5 million tamales later, things sour, consultants vamoose. In-house employees, including a friend of the Tank, go through the consultants' notes for wisdom droppings. They're amazed and amused to find serious dirt on each bigwig manager. Not just salient stuff, but scoop like "married x years, has y kids. Loves Buffalo Bills. Doesn't like dirty jokes." Do you know what (or who) *your* consultants are researching on your dime?

IN A RECENT Daily Shark (seen it? computerworld.com/sharky), Sharky asked for stories about employee Internet abuse. They're rolling in. Highlight: the head of IT at a wholesale company who turned out to be hosting Web sites as a side business. So *that's* where the bandwidth went. Keep 'em coming!

A CERTAIN defense company gets Generally Dynamite reviews in the media for its mega-outsourcing deal with CSC. But when the Software Engineering Institute recently laid a prestigious Software Capability Maturity Model Rating Level 3 on CSC for its work with the conglomerate, an outraged pilot fish dropped Sharky a line. This fish's business unit is baffled by the awards and kudos. "CSC doesn't change what a business unit is

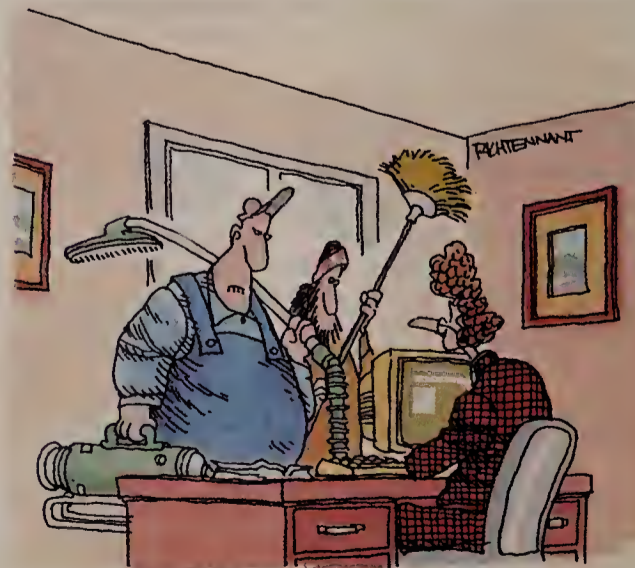
doing. They just keep sucking money like a jetliner sucking fuel." Whoeee, them's fightin' words!

GARTNER ITXPO Symposium. Last week. Analyst Michael Zbouray: "Any good Unix security engineer can clean up any Unix box. But I'm not sure there are people even within Microsoft who know how to clean up an NT box." From the peanut gallery: "What operating system would you recommend?" Pause. Zbouray: "You tempt me." The audience of 300 sets up a chant: "Go for it! Go for it! Go for it!" Zbouray throws arms in air, shouts: "Linux rules!" And the crowd goes wild.

SPEAKING OF GARTNER, here's some advice from Paul McGuckin, another Stamford Solon: Let's say you're nervous about your software vendor's plans for your favorite platform. Ask for a revenue breakdown by platform. ("Sign an NDA — this is one time it's worth it," McGuckin says.) At the top of the sales graph, you'll see two or three platforms, then a gap, then a cluster at the bottom. "If your platform is in that top group," McGuckin says, "you're in."

If your luck runs like Sharky's, your platform isn't even on the charts. Ah well, that's what the Tank is here for: Gripin' and groanin'. So hit me: sharky@computerworld.com. If your item runs, you get a killer T-shirt.

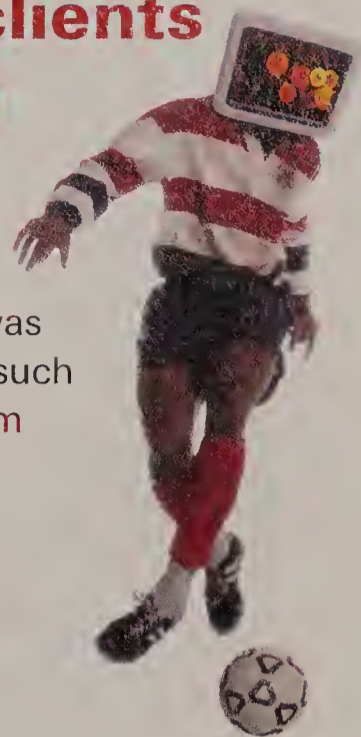
The 5th Wave



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